

Home Theater BD Player HTB3560/12/78 K/98/94/40/55

Service
Service
Service



Service Manual

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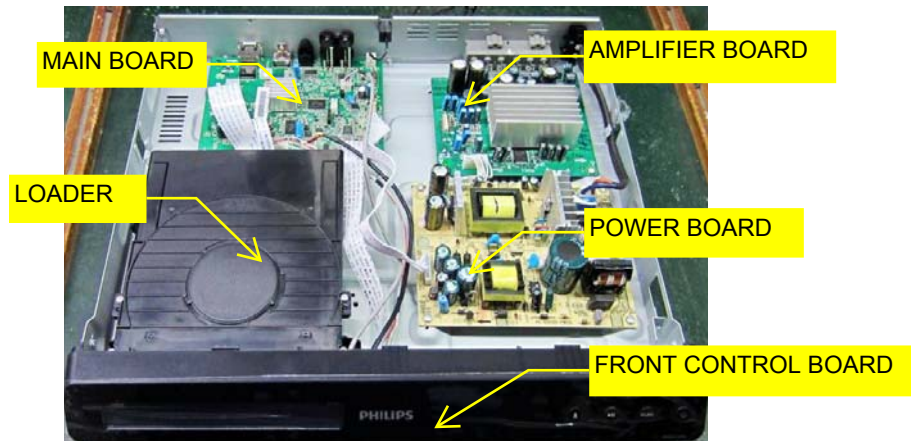
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**CLASS 1
LASER PRODUCT**

 3141 785 38343

PCB BOARD LOCATION:**VERSION VARIATIONS**

Type / Versions Board in used Service Police		HTB3560					
		/12	/78	K/98	/94	40	55
MAIN BOARD		M	M	M	M	M	M
FRONT CONTROL BOARD		M	M +C	M +C	M +C	M +C	M +C
POWER BOARD		M	M +C	M +C	M +C	M +C	M +C
AMPLIFIER BOARD		M	M +C	M +C	M +C	M +C	M +C
LOADER		M	M	M	M	M	M
* Tips: C -- Component Lever Repair M -- Module Lever Repair X -- Used							

Production Specifications:

Note

- Specifications and design are subject to change without notice.

Region codes

The type plate on the back or bottom of the home theater shows which regions it supports.

Country	DVD	BD
Europe, United Kingdom	 	
Asia Pacific, Taiwan, Korea	 	
Latin America	 	
Australia, New Zealand	 	
Russia, India	 	
China	 	

Media formats

- AVCHD, BD, BD-R/ BD-RE, BD-Video, DVD-Video, DVD+R/+RW, DVD-R/-RW, DVD+R/-R DL, CD-R/CD-RW, Audio CD, Video CD/SVCD, Picture files, MP3 media, WMA media, DivX Plus HD media, USB storage device

File formats

- Audio: .aac, .mka, .mp3, .wma, .wav
- Video: .avi, .divx, .mp4, .mkv, .mpg, .mpeg, .rmvb, .rm
- Picture: .jpg, .jpeg, .gif, .png

Amplifier

- Total output power: 300W RMS (30% THD)
- Frequency response: 20 Hz-20 kHz / ± 3 dB
- Signal-to-noise ratio: > 65 dB (CCIR) / (A-weighted)
- Input sensitivity:
 - AUX: 2 V
 - Music iLink: 1 V

Video

- Signal system: PAL / NTSC
- HDMI output: 480i/576i, 480p/576p, 720p, 1080i, 1080p, 1080p24

Audio

- S/PDIF Digital audio input:
 - Coaxial: IEC 60958-3
 - Optical: TOSLINK
- Sampling frequency:
 - MP3: 32 kHz, 44.1 kHz, 48 kHz
 - WMA: 44.1 kHz, 48 kHz
- Constant bit rate:
 - MP3: 32 kbps - 320 kbps
 - WMA: 48 kbps - 192 kbps

Radio

- Tuning range:
 - Europe/Russia/China: FM 87.5-108 MHz (50 kHz)
 - Asia Pacific/Latin America: FM 87.5-108 MHz (50/100 kHz)
- Signal-to-noise ratio: FM 50 dB
- Frequency response: FM 200 Hz-12.5 kHz / ± 6 dB

USB

- Compatibility: Hi-Speed USB (2.0)
- Class support: USB Mass Storage Class (MSC)
- File system: FAT16, FAT32, NTFS
- Maximum memory support: < 160 GB

Main unit

- Power supply:
 - Europe/China/Russia/India: 220-240 V~, 50 Hz
 - Latin America/Asia Pacific: 110-240 V~, 50-60 Hz
- Power consumption: 60 W
- Standby power consumption: ≤ 0.5 W
- Dimensions (WxHxD): 360 x 58 x 325 mm
- Weight: 2.4 kg

Subwoofer

- Output power: 50 W RMS (30% THD)
- Impedance: 4 ohm
- Speaker drivers: 133 mm (5.25") woofer
- Dimensions (WxHxD): 160 x 265 x 265 mm
- Weight: 2.50 kg

Speakers

Center speaker:

- Output power: 50 W RMS (30% THD)
- Speaker impedance: 4 ohm
- Speaker drivers: 1 x 63.5 mm (2.5") woofer
- Dimensions (WxHxD): 84.5 x 89 x 89 mm
- Weight: 0.27 kg

Front speaker:

- Output power: 2 x 50 W RMS (30% THD)
- Speaker impedance: 4 ohm
- Speaker drivers: 1 x 63.5 mm (2.5") woofer
- Dimensions (WxHxD): 84.5 x 159 x 80 mm
- Weight: 0.35 kg/each

Rear speaker:

- Output power: 2 x 50 W RMS (30% THD)
- Speaker impedance: 4 ohm
- Speaker drivers: 1 x 63.5 mm (2.5") woofer
- Dimensions (WxHxD): 84.5 x 89 x 89 mm
- Weight: 0.27 kg/each

Remote control batteries

- 2 x AAA-R03-1.5 V

Laser

- Laser Type (Diode): InGaN/AlGaIn (BD), AlGaInP (DVD/CD)
- Wave length: 405 +7 nm/-7 nm (BD), 655 +10 nm/-10 nm (DVD), 790 +10 nm/-20 nm (CD)
- Output power (Max. ratings): 20 mW (BD), 6 mW (DVD), 7 mW (CD)

Safety instruction, Warning & Notes

Safety instruction

1. General safety

Safety regulations require that during a repair:

- . Connect the unit to the mains via an isolation transformer.
- . Replace safety components indicated by the symbol , only by components identical to the original ones. Any other component substitution (other than original type) may increase risk of fire or electrical shock hazard.

Safety regulations require that after a repair, you must return the unit in its original condition. Pay, in particular, attention to the following points:

- . Route the wires/cables correctly, and fix them with the mounted cable clamps.
- . Check the insulation of the mains lead for external damage.
- . Check the electrical DC resistance between the mains plug and the secondary side:
 - 1) Unplug the mains cord, and connect a wire between the two pins of the mains plug.
 - 2) Set the mains switch the "on" position (keep the mains cord unplugged).
 - 3) Measure the resistance value between the mains plug and the front panel, controls, and chassis bottom.
 - 4) Repair or correct unit when the resistance measurement is less than 1M Ω .
 - 5) Verify this, before you return the unit to the customer/user (ref. UL-standard no. 1492).
 - 6) Switch the unit "off", and remove the wire between the two pins of the mains plug.

2. Laser safety

This unit employs a laser. Only qualified service personnel may remove the cover, or attempt to service this device (due to possible eye injury).

Laser device unit

Type	: Semiconductor laser GaAlAs
Wavelength	: 650nm (DVD)
	: 780nm (VCD/CD)
Output power	: 7mW (DVD)
	: 10mW (DVD /CD)

Beam divergence: 60 degree

Note: Use of controls or adjustments or performance of procedure other than those specified herein, may result in hazardous radiation exposure. Avoid direct exposure to beam.

Warning

1. General

. All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. Make sure that, during repair, you are at the same potential as the mass of the set by a wristband with resistance. Keep components and tools at this same potential. Available ESD protection equipment:

- 1) Complete kit ESD3 (small tablemat, wristband, connection box, extension cable and earth cable) 4822 310 10671.
- 2) Wristband tester 4822 344 13999.

. Be careful during measurements in the live voltage section. The primary side of the power supply, including the heat sink, carries live mains voltage when you connect the player to the mains (even when the player is "off"!). It is possible to touch copper tracks and/or components in this unshielded primary area, when you service the player. Service personnel must take precautions to prevent touching this area or components in this area. A "lighting stroke" and a stripe-marked printing on the printed wiring board, indicate the primary side of the power supply.

. Never replace modules, or components, while the unit is "on".

2. Laser

- . The use of optical instruments with this product, will increase eye hazard.
- . Only qualified service personnel may remove the cover or attempt to service this device, due to possible eye injury.
- . Repair handling should take place as much as possible with a disc loaded inside the player.
- . Text below is placed inside the unit, on the laser cover shield:

**CAUTION: VISIBLE AND INVISIBLE LASER
RADIATION WHEN OPEN, AVOID EXPOSURE
TO BEAM.**

Notes: Manufactured under licence from Dolby Laboratories. The double-D symbol is trademarks of Dolby Laboratories, Inc. All rights reserved.

Service Hints

CAUTION

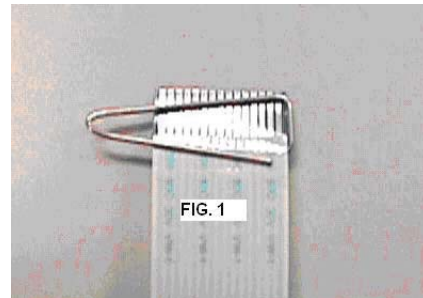
CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE DRIVE ELECTRONICS WHEN CONNECTING A NEW DRIVE. THAT'S WHY, BESIDES THE SAFETY MEASURES LIKE

- **SWITCH OFF POWER SUPPLY**
- **ESD PROTECTION**

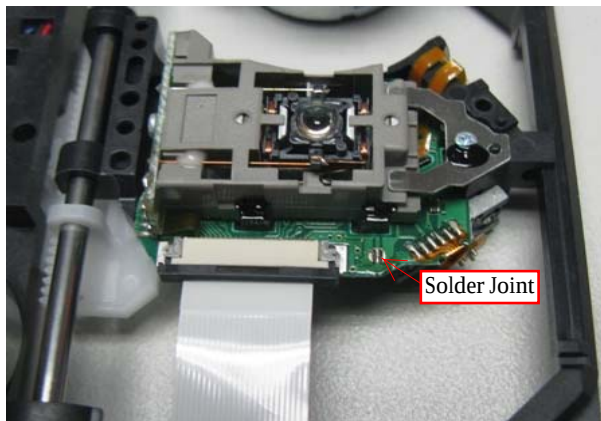
ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

The following steps have to be done when replacing the defective loader :

1. Dismantling of the loader to access the ESD protection point if necessary.
2. **Solder the ESD protection point*.**
3. Disconnect flexfoil cable from the defective loader.
4. Put a paper clip on the flexfoil to short-circuit the contacts (fig.1)
5. Replace the defective loader with a new loader.
6. Remove paperclip from the flexfoil and connect it to the new loader.
7. Remove solder joint on the ESD protection point.



ATTENTION: The laser diode of this loader is protected against ESD by a solder joint which shortcircuits the laserdiode to ground. For proper functionality of the loader this solder joint must be remove **after** connection loader to the set.



(ESD protection point is accessible from top of loader)

****Only applicable for defective loader needed to be sent back to supplier for failure analysis and to support backcharging evidence.***

This is also applicable for all partnership workshops.

Notes

Lead-Free requirement for service

IDENTIFICATION:

Regardless of special logo (not always indicated) 

One must treat all sets from 1.1.2005 onwards, according next rules.

Important note: In fact also products a little older can also be treated in this way as long as you avoid mixing solder-alloys (leaded/ lead-free). So best to always use SAC305 and the higher temperatures belong to this.

Due to lead-free technology some rules have to be respected by the workshop during a repair:

- Use only lead-free solder alloy Philips SAC305 with order code 0622 149 00106. If lead-free solder-paste is required, please contact the manufacturer of your solder-equipment. In general use of solder-paste within workshops should be avoided because paste is not easy to store and to handle.
- Use only adequate solder tools applicable for lead-free solder alloy. The solder tool must be able
 - To reach at least a solder-temperature of 400°C,
 - To stabilize the adjusted temperature at the solder-tip
 - To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature around 360°C – 380°C is reached and stabilized at the solder joint. Heating-time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C otherwise wear-out of tips will rise drastically and flux-fluid will be destroyed. To avoid wear-out of tips switch off un-used equipment, or reduce heat.
- Mix of lead-free solder alloy / parts with leaded solder alloy / parts is possible but PHILIPS recommends strongly to avoid mixed solder alloy types (leaded and lead-free). If one cannot avoid, clean carefully the solder-joint from old solder alloy and re-solder with new solder alloy (SAC305).

- Use only original spare-parts listed in the Service-Manuals. Not listed standard-material (commodities) has to be purchased at external companies.
- Special information for BGA-ICs:
 - always use the 12nc-recognizable soldering temperature profile of the specific BGA (for de-soldering always use highest lead-free temperature profile, in case of doubt)
 - lead free BGA-ICs will be delivered in so-called 'dry-packaging' (sealed pack including a silica gel pack) to protect the IC against moisture. After opening, dependent of MSL-level seen on indicator-label in the bag, the BGA-IC possibly still has to be baked dry. This will be communicated via AYS-website.
- Do not re-use BGAs at all.
- For sets produced before 1.1.2005, containing leaded soldering-tin and components, all needed spare-parts will be available till the end of the service-period. For repair of such sets nothing changes.
- On our website:

www.atyourservice.ce.Philips.com

You find more information to:

BGA-de-/soldering (+ baking instructions)
Heating-profiles of BGAs and other ICs used in Philips-sets

You will find this and more technical information within the "magazine", chapter "workshop news".
For additional questions please contact your local repair-helpdesk.

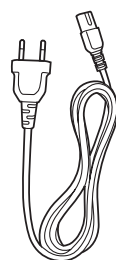
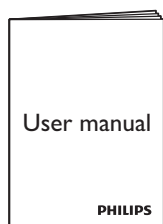
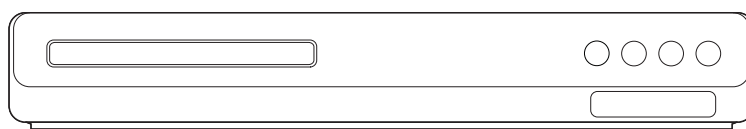
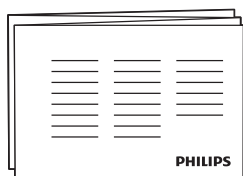


EN Before using your product, read all accompanying safety information

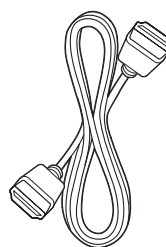
MS Sebelum menggunakan produk anda, baca semua maklumat keselamatan yang disertakan

**ZH
CN** 使用产品前，请阅读所有随附的安全信息

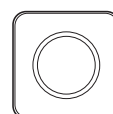
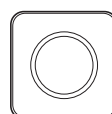
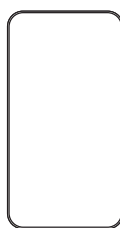
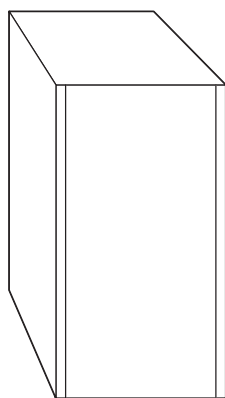
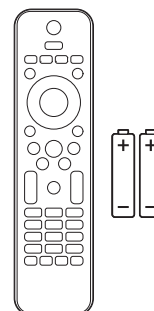
**ZH
TW** 使用您的產品前，請先閱讀所有附隨的安全資訊



Power Cord



HDMI



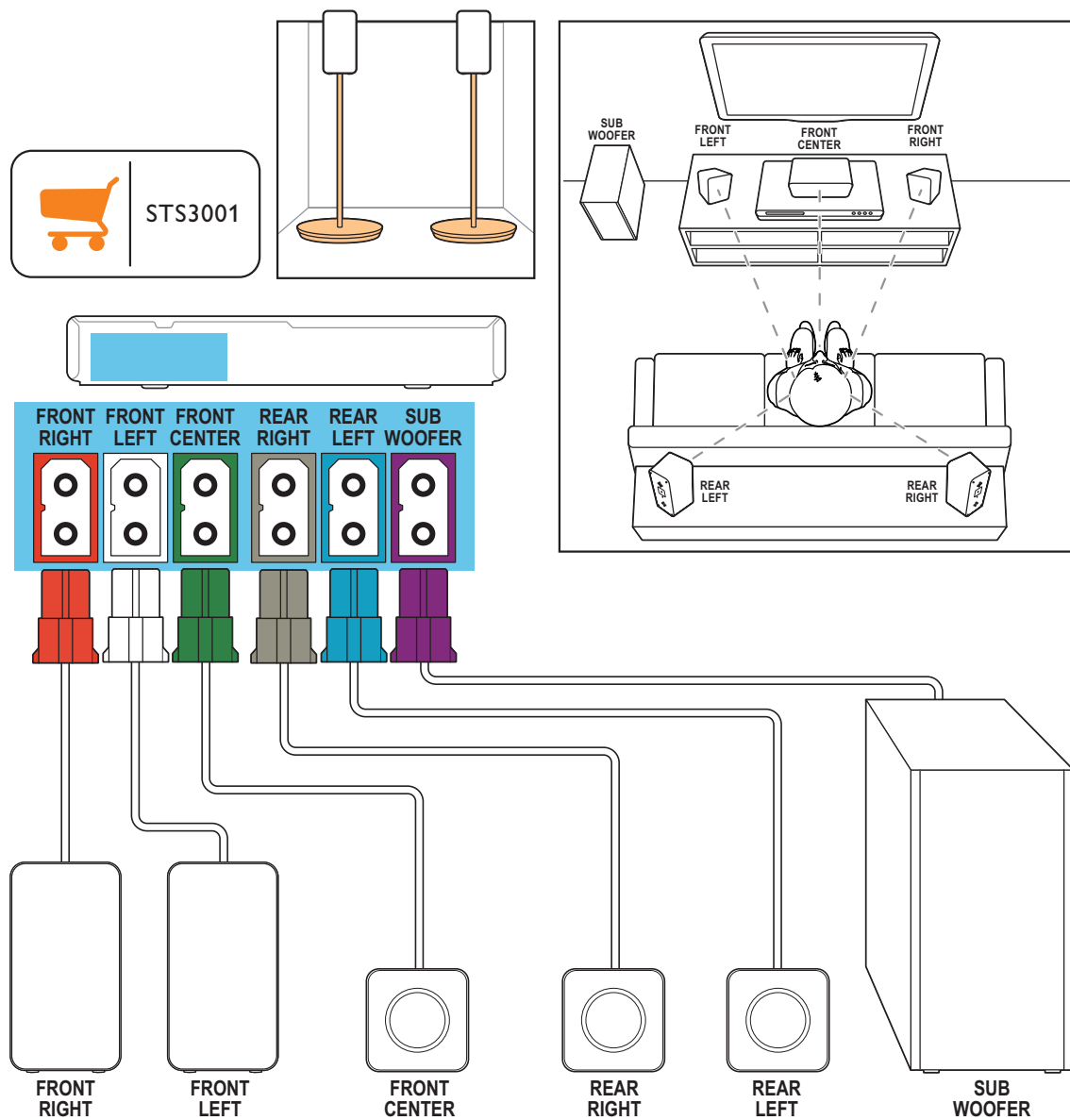
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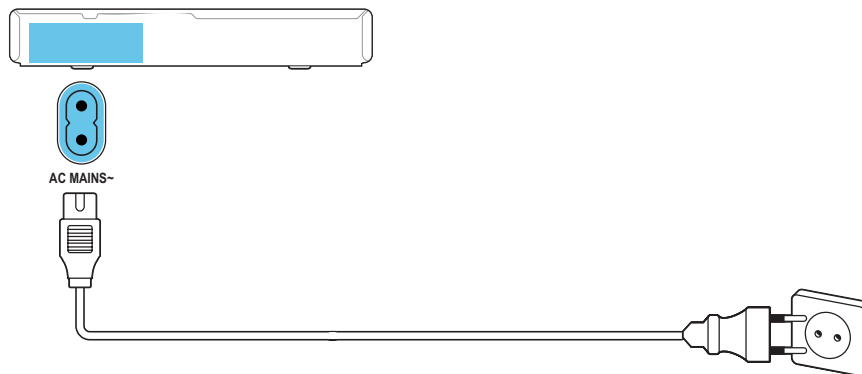
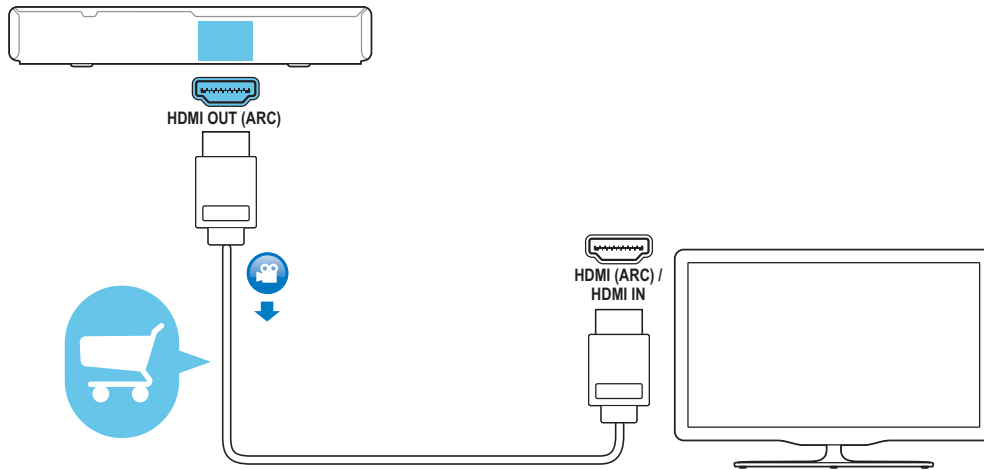
EN Connect the home theater

MS Sambungkan teater rumah

ZH 连接家庭影院
CN

ZH 連線至家庭劇院
TW





2

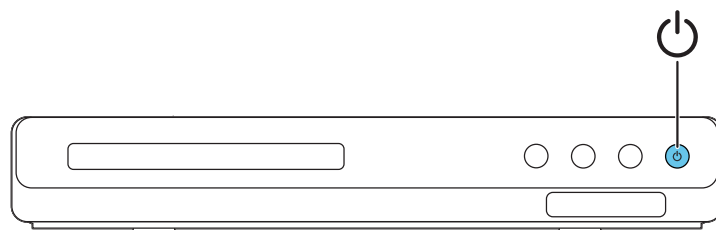
EN Switch on the home theater

MS Hidupkan teater rumah

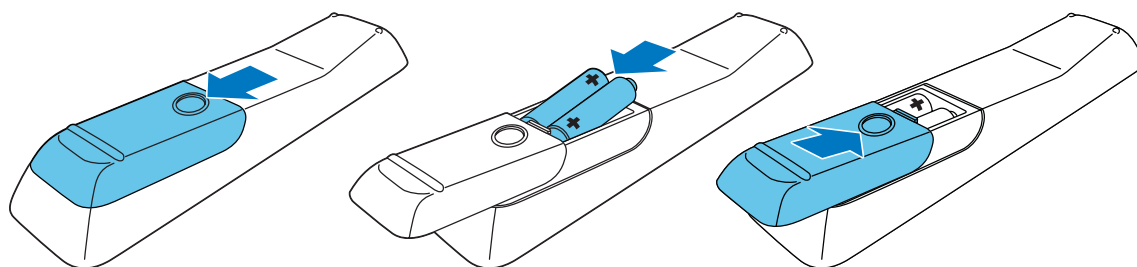
**ZH
CN** 打开家庭影院

**ZH
TW** 開啟家庭劇院

1

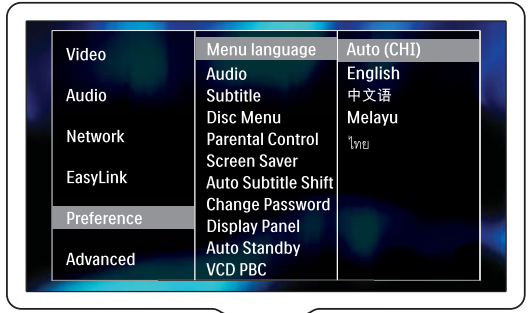
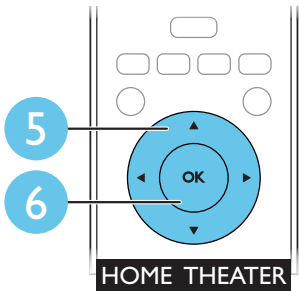
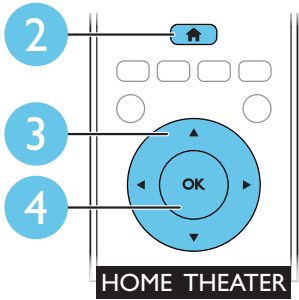
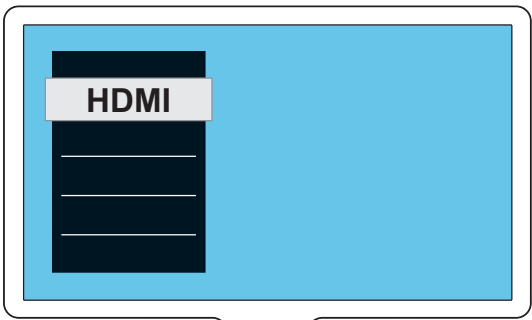
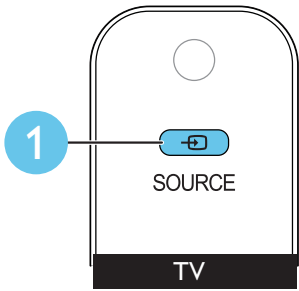
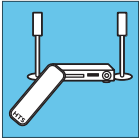


2



3

EN Complete the first time setup
MS Lengkapi persediaan kali pertama
ZH 完成首次设置
CN
ZH 完成首次設定
TW



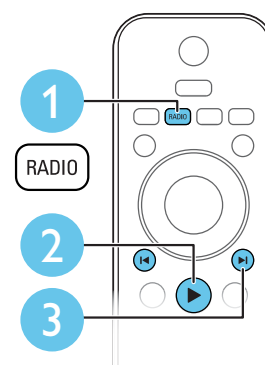
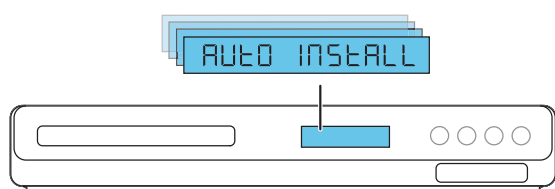
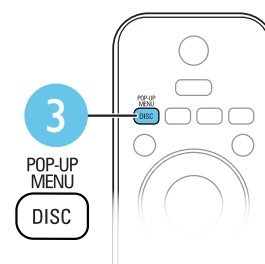
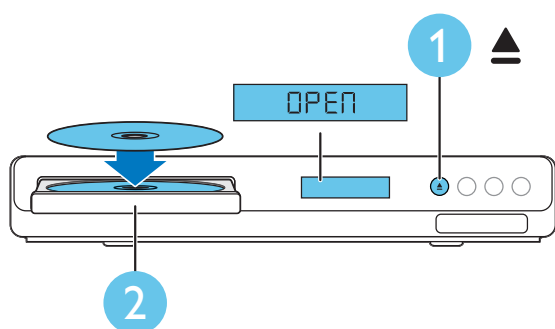
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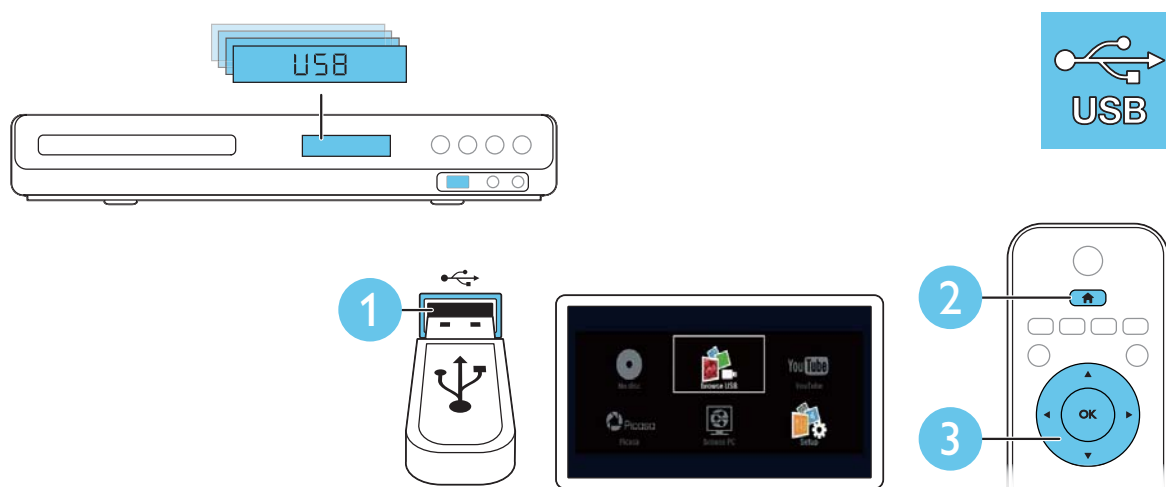
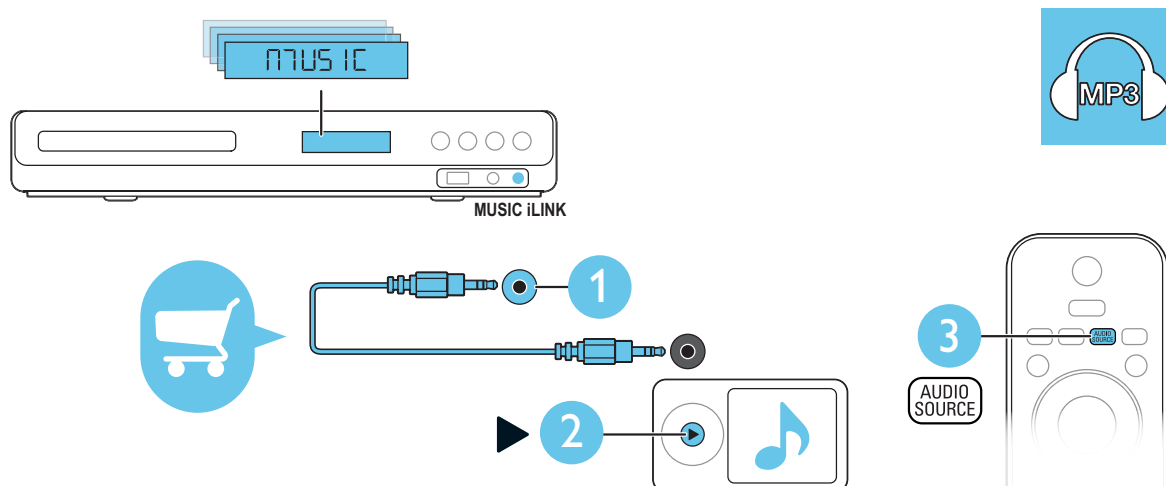
EN Use your home theater

MS Gunakan teater rumah anda

ZH 使用家庭影院
CN

ZH 使用您的家庭劇院
TW



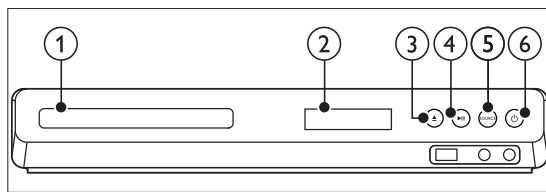


Your home theater

Congratulations on your purchase, and welcome to Philips! To fully benefit from the support that Philips offers (e.g. notification of product software upgrade), register your product at www.philips.com/welcome.

Main unit

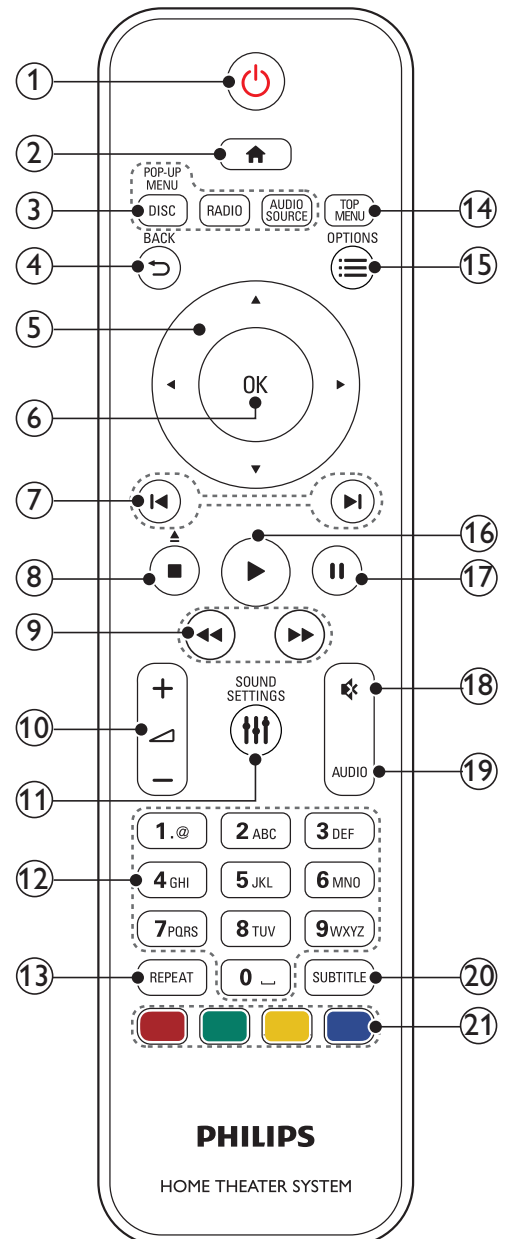
This section includes an overview of the main unit.



- ① **Disc compartment**
- ② **Display panel**
- ③ **▲ (Open/Close)**
Open or close the disc compartment, or eject the disc.
- ④ **▶|| (Play/Pause)**
Start, pause or resume play.
- ⑤ **SOURCE**
Select an audio or video source for the home theater.
- ⑥ **⏻ (Standby-On)**
Switch the home theater on or to standby.

Remote control

This section includes an overview of the remote control.



- ①  **(Standby-On)**
 - Switch the home theater on or to standby.
 - When EasyLink is enabled, press and hold for at least three seconds to switch all connected HDMI CEC compliant devices to standby.
- ②  **(Home)**
Access the home menu.
- ③ **Source buttons**
 - **DISC/POP-UP MENU** : Switch to disc source. Access or exit the disc menu when you play a disc.
 - **RADIO** : Switch to FM radio.
 - **AUDIO SOURCE** : Select an audio input source.
- ④  **BACK**
 - Return to a previous menu screen.
 - In radio mode, press and hold to erase the current preset radio stations.
- ⑤ **Navigation buttons**
 - Navigate menus.
 - In radio mode, press left or right to start auto search.
 - In radio mode, press up or down to tune the radio frequency.
- ⑥ **OK**
Confirm an entry or selection.
- ⑦  **(Previous/Next)**
 - Skip to the previous or next track, chapter or file.
 - In radio mode, select a preset radio station.
- ⑧  **(Stop) / ▲ (Eject/Open/Close)**
 - Stop play.
 - Press and hold for three seconds to open or close the disc compartment, or eject the disc.
- ⑨  **(Fast Backward / Fast Forward)**
Search backwards or forward. Press repeatedly to change the search speed.
- ⑩  **+/- (Volume)**
Increase or decrease volume.
- ⑪  **SOUND SETTINGS**
Access or exit sound options.
- ⑫ **Alphanumeric buttons**
Enter values or letters (using SMS style entry).
- ⑬ **REPEAT**
Select or turn off repeat mode.
- ⑭ **TOP MENU**
Access the main menu of a disc.
- ⑮  **OPTIONS**
 - Access more play options while playing a disc or a USB storage device.
 - In radio mode, set a radio station.
- ⑯  **(Play)**
Start or resume play.
- ⑰  **(Pause)**
Pause play.
- ⑱  **(Mute)**
Mute or restore volume.
- ⑲ **AUDIO**
Select an audio language or channel.
- ⑳ **SUBTITLE**
Select subtitle language for video.
- ㉑ **Color buttons**
Select tasks or options for Blu-ray discs.

Mechanical and Dismantling Instructions

Dismantling Instruction

Detailed information please refer to the model set.

The following guidelines show how to dismantle the player.

Step1: Remove 6 screws around the Top Cover, and then remove the Top Cover (Figure 1).



Figure 1

Step2: If it is necessary to dismantle Loader or Front Panel, the Front door should be removed first. (Figure 2)

Method A): Turn on the power button, then press open button to dismantle front door. Please kindly note that power off as soon as front door is out of machine.

Method B): If the tray can't open in normal way, you can make it through the instruction as below, an emergency exit at bottom cover of the machine.

Note: Make sure to operate gently otherwise the guider would be damaged.



Method A)



Method B)

Please kindly note that dismantle the front door assembly carefully to avoid damage tray and the front door.

Figure 2

Mechanical and Dismantling Instructions

Dismantling Instruction

Detailed information please refer to the model set.

Step3 :Dismantle Front Panel, disconnect the connectors (XS604, XP12), need release 2 snaps of Front Panel & 2 snaps of bottom cabinet , then gently pull the Panel out from the set. (Figure 3)

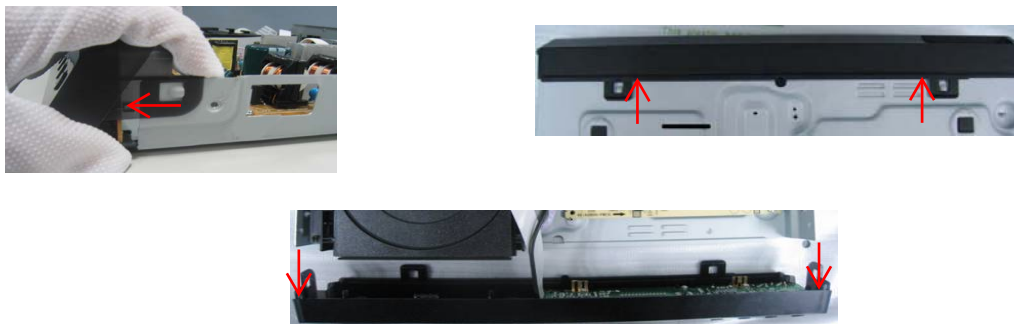


Figure 3

Step4 : Dismantle Front Control Board,remove 5 screws (Figure 4)

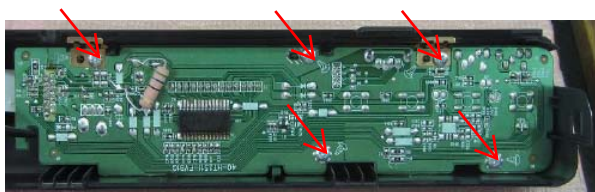


Figure 4

Step5 : Dismantle Loader, disconnect the 3 connectors (XP3, XP2, XP6) aiming in the below figure, and remove 2 screws that connects the loader and the bottom cabinet. (Figure 5)

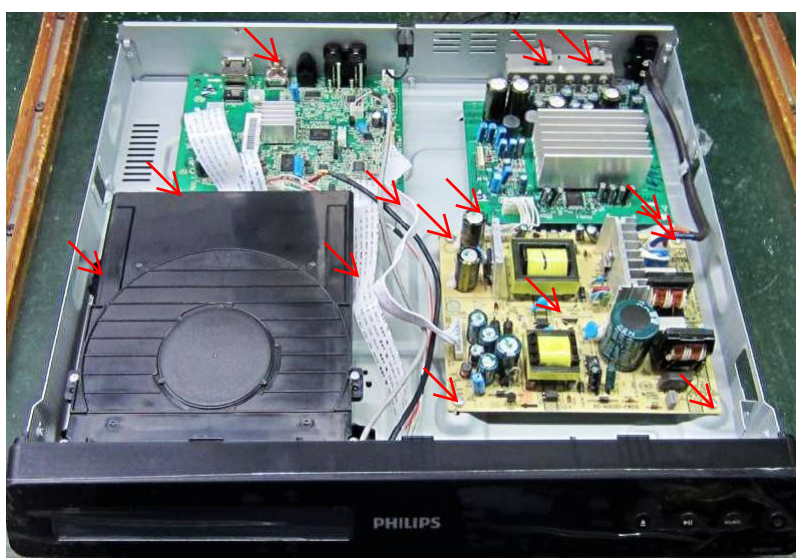


Figure 5

Mechanical and Dismantling Instructions

Dismantling Instruction

Detailed information please refer to the model set.

Step6: Dismantle Main Board, first disconnect 2 connectors (XP1, XP11), and then remove 5 screws. (Figure 5/6)

Step7: Dismantle Power Board, disconnect the connectors XP502 and CN502 on Power Board, then remove 5 screws. (Figure 5/6)

Step8: Dismantle Amplifier Board, remove 4 screws (Figure 5/6)

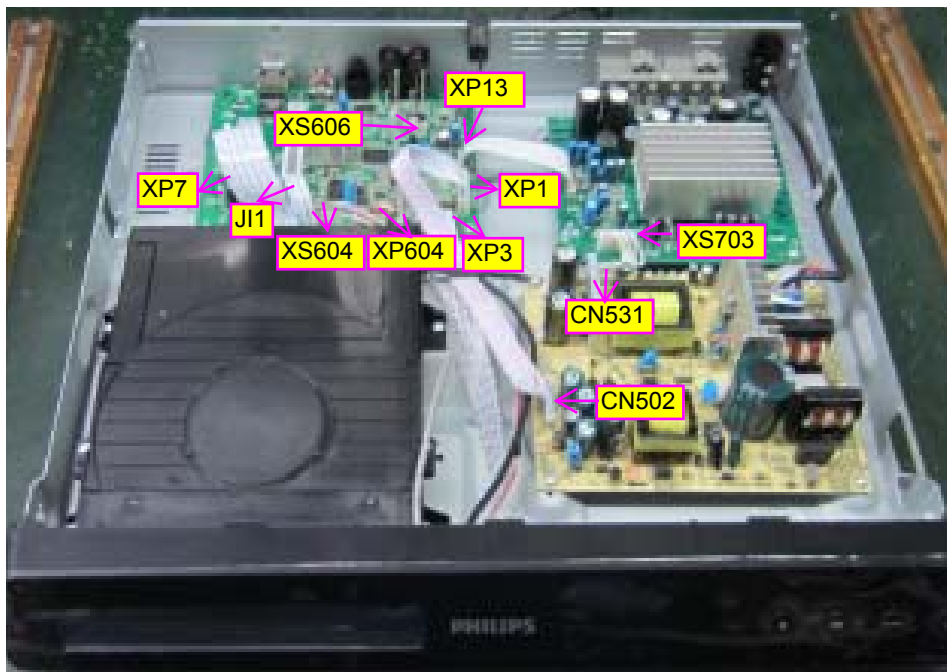


Figure 6

Software Upgrade

1. There are 2 ways to software upgrade:

First :

Upgrade from USB:

New a folder in root directory of USB and name it 'UPG'. Copy the upgrade file HTB3560.BIN to the UPG directory then press the HOME key on RC into HOME screen .Select 'Setup'->'Advanced'->'Software update'->'USB' in order and then press OK key .

When upgrade file detected, select "Start" to upgrade, select "Cancel" to cancel.

After upgrading begins, a message "Do not switch off" will show, or the product will hang up and upgrading failed.

After you cancel, the product would return setting screen and the software would not be upgraded.

Second:

Upgrade from Network:

Keep the product connect to internet. press the HOME key on RC into HOME screen .Select 'Setup'->'Advanced'->'Software update'->'Network' in order and then press OK key .

When upgrade file detected, select "OK" to download, select "Cancel" to cancel. After the software is downloaded, select to upgrade or cancel.

After upgrading begins, a message "Do not switch off" will show, or the product will hang up and upgrading failed.

After you cancel, the product would return setting screen and the software would not be upgraded.

2. Check the version information after upgraded.

Press the Home key on RC , select 'Setup'->'Advanced'->'Version information' in order, and then press OK Key you will see a interface like below:

Model:HTB3560/78

Version

SystemSW:x.xx.xx

Subsystem SW:xx-xx-xx-xx

Ethernet MAC:xx:xx:xx:xx:xx:xx

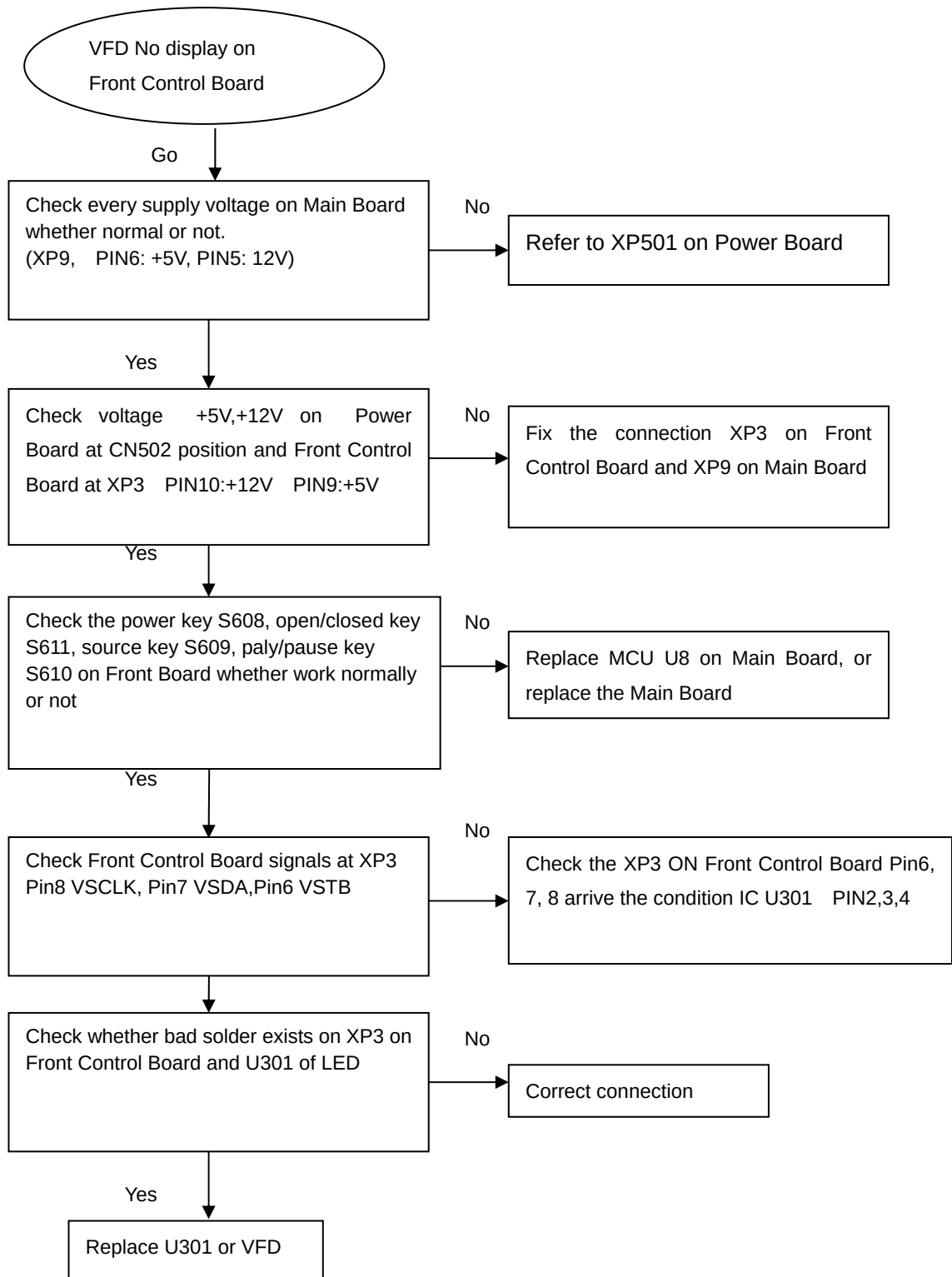
EUI64:xx xx xx xx xx xx xx xx

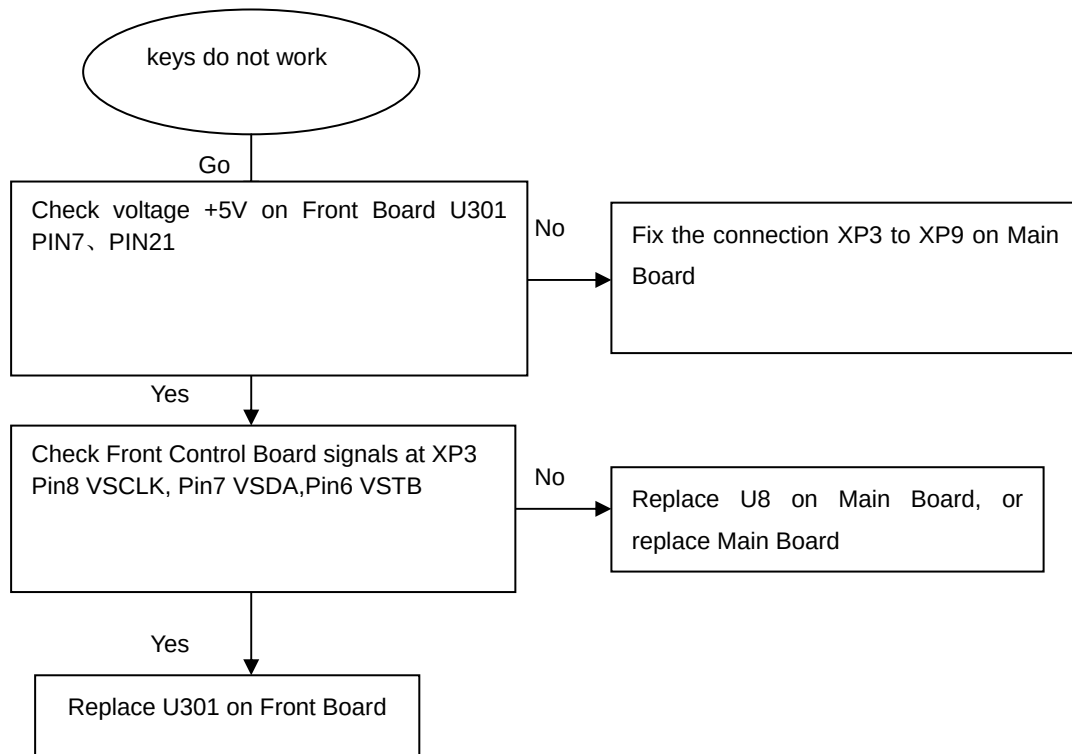
For information,frequently asked question and software updates,visit

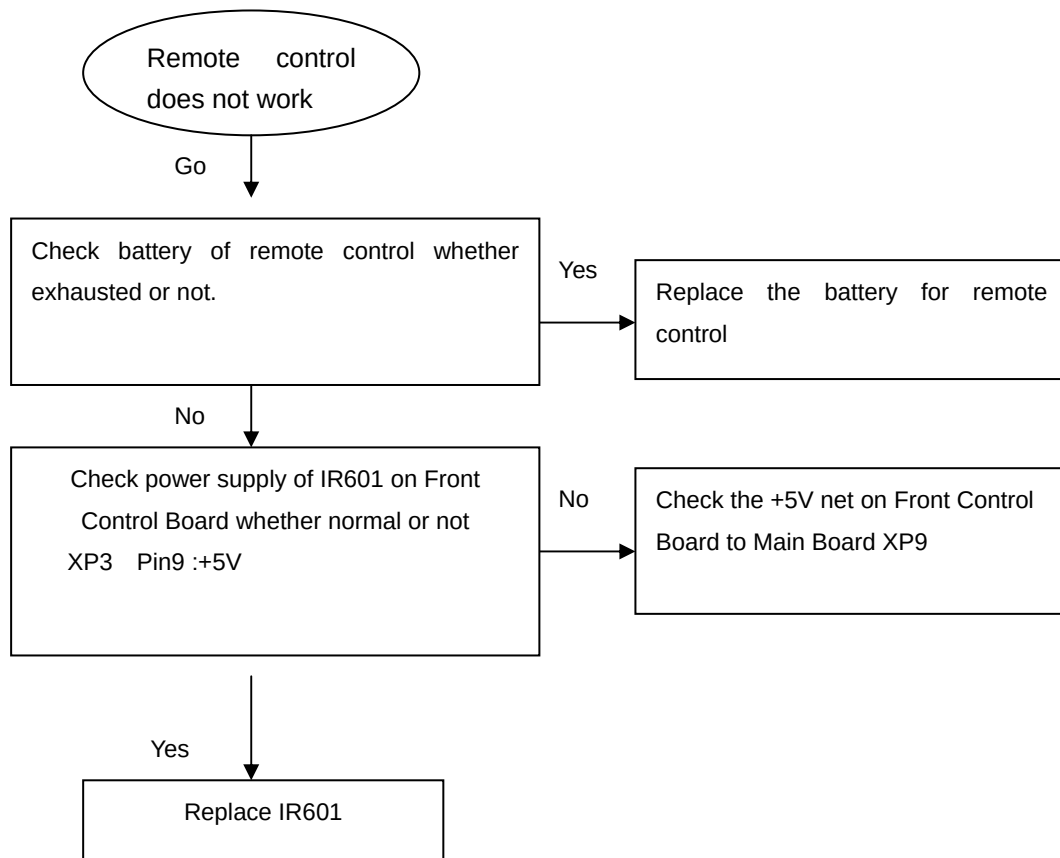
www.philips.com/support.

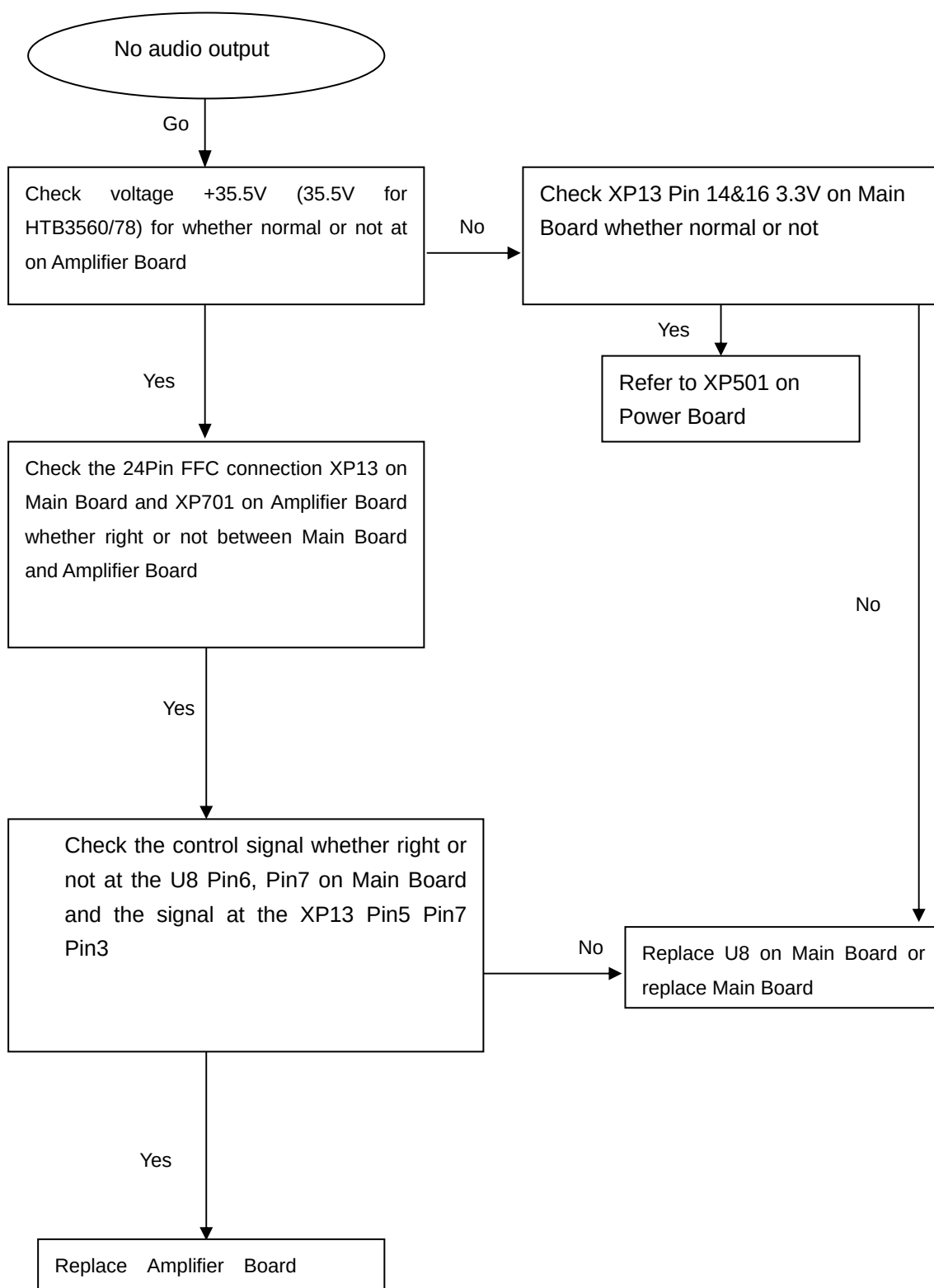
Close

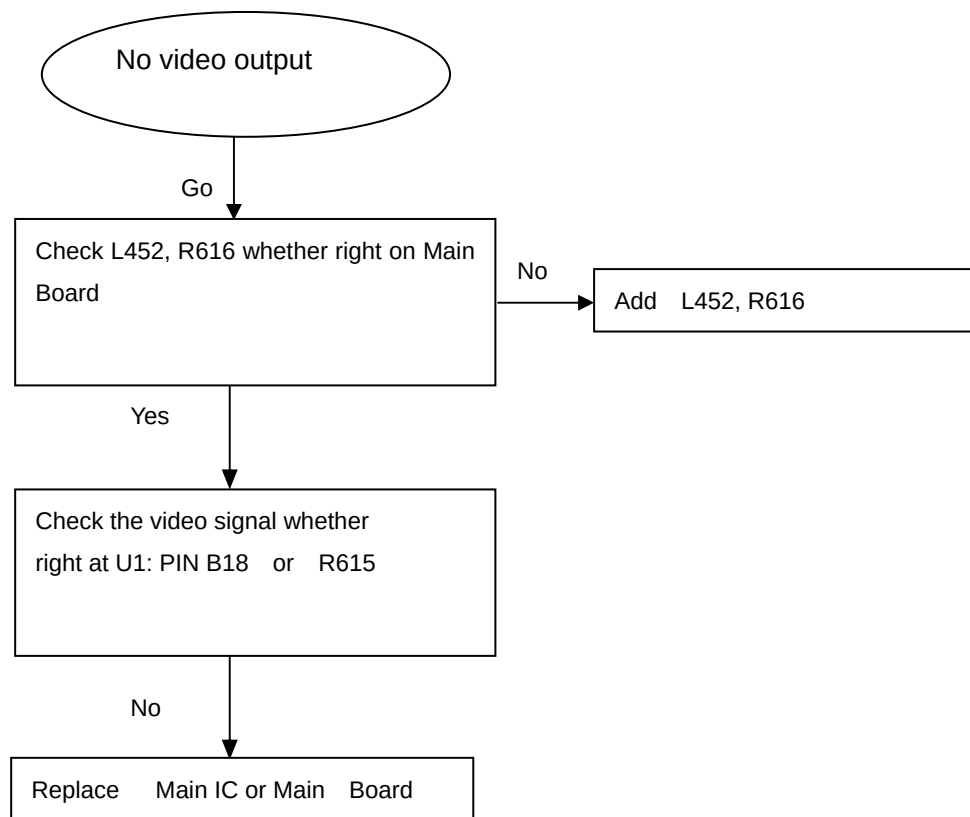
VFD No display on Front Control Board

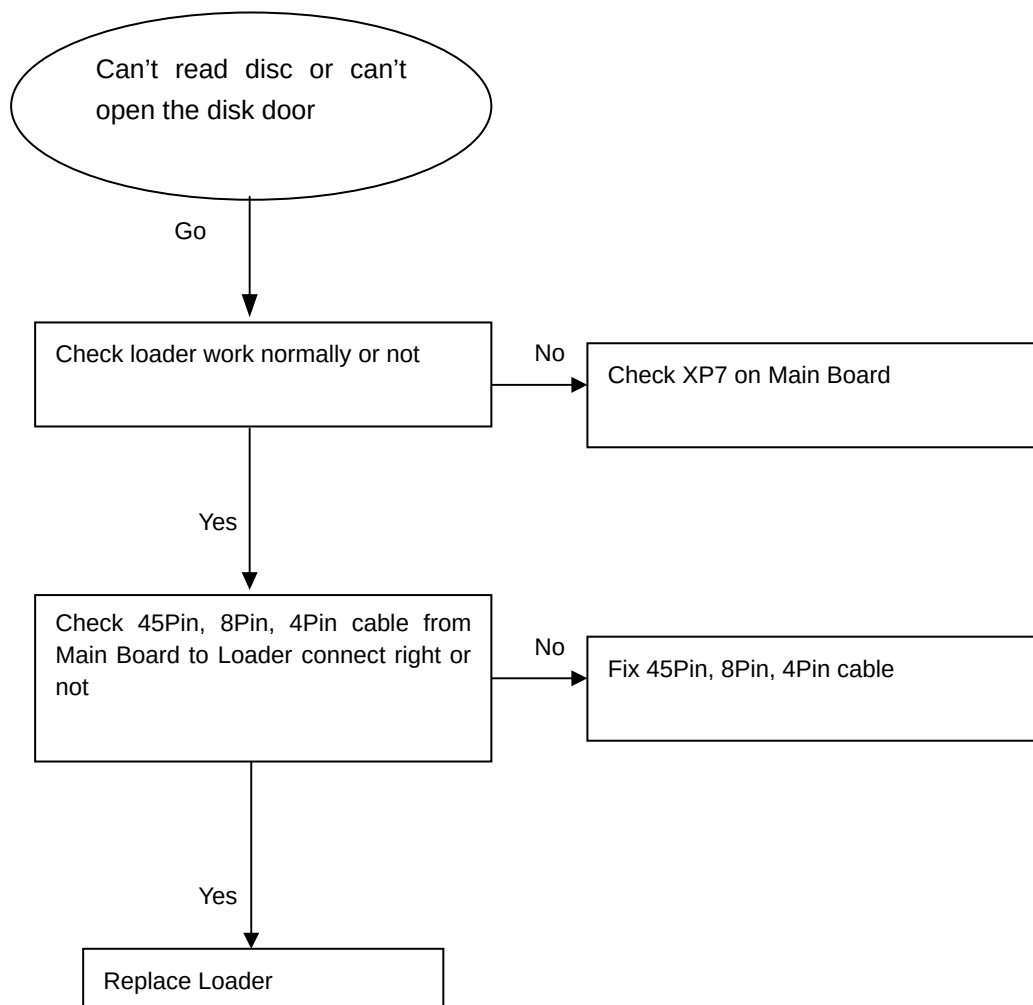


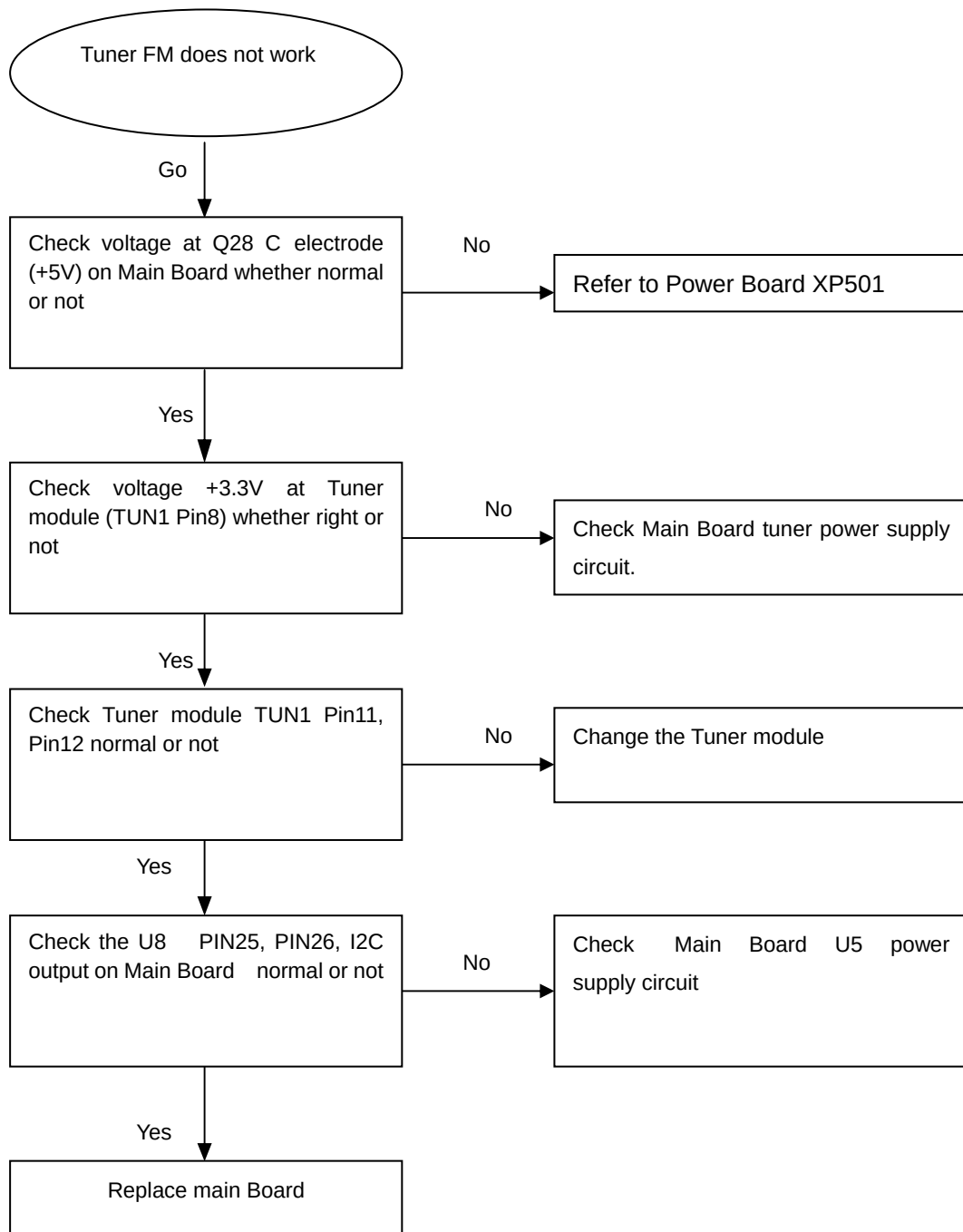
keys do not work

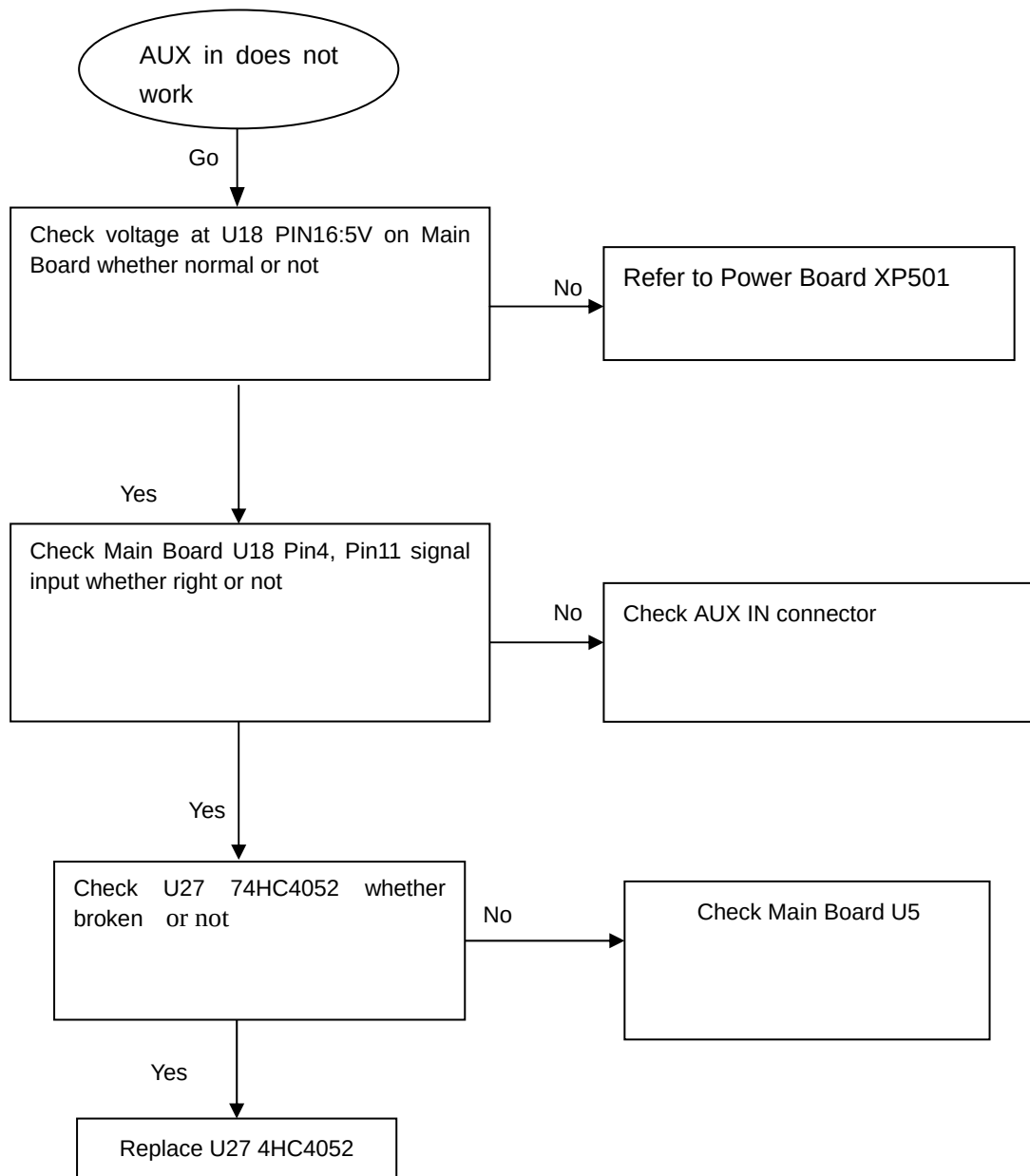
Remote control does not work

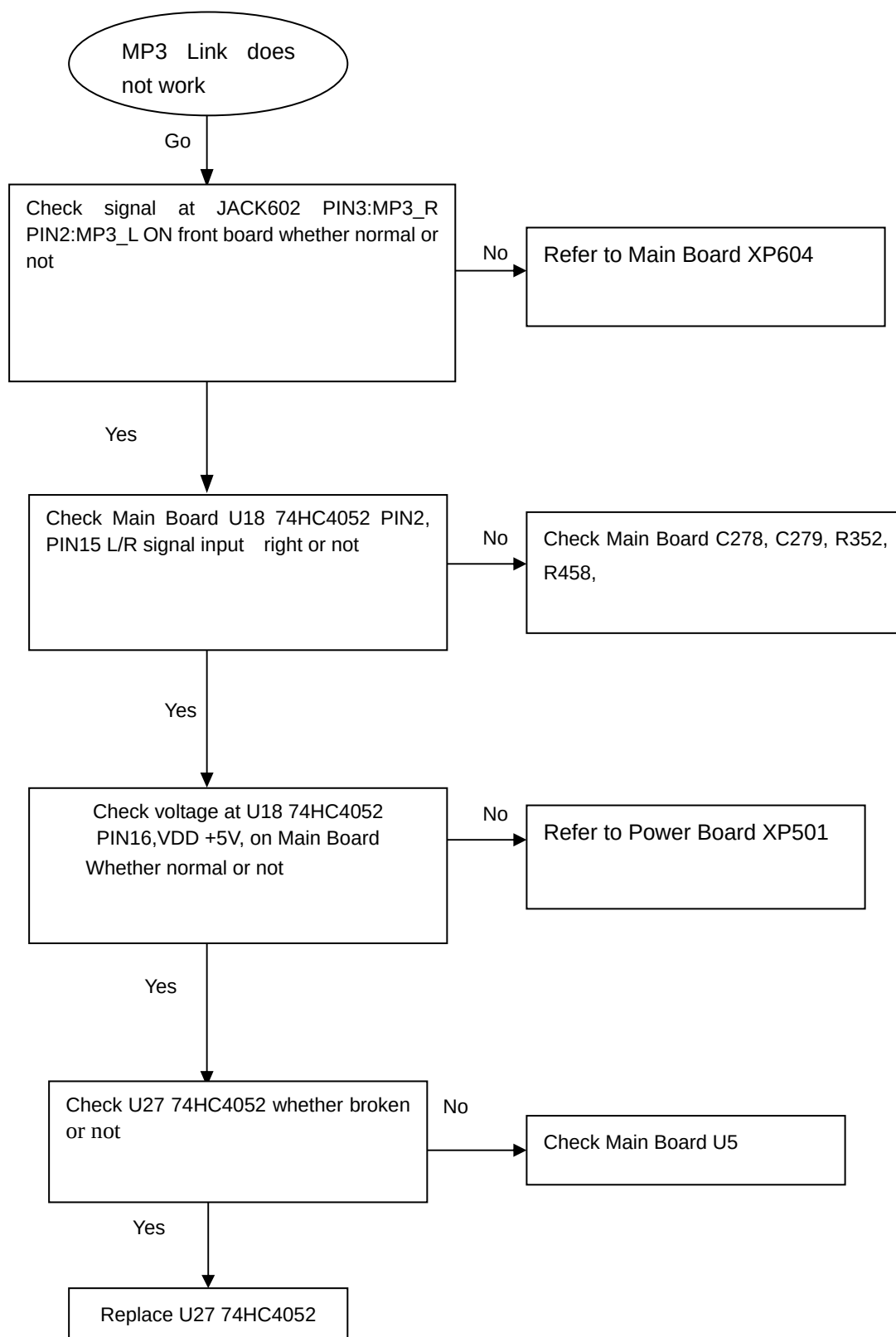
No audio output

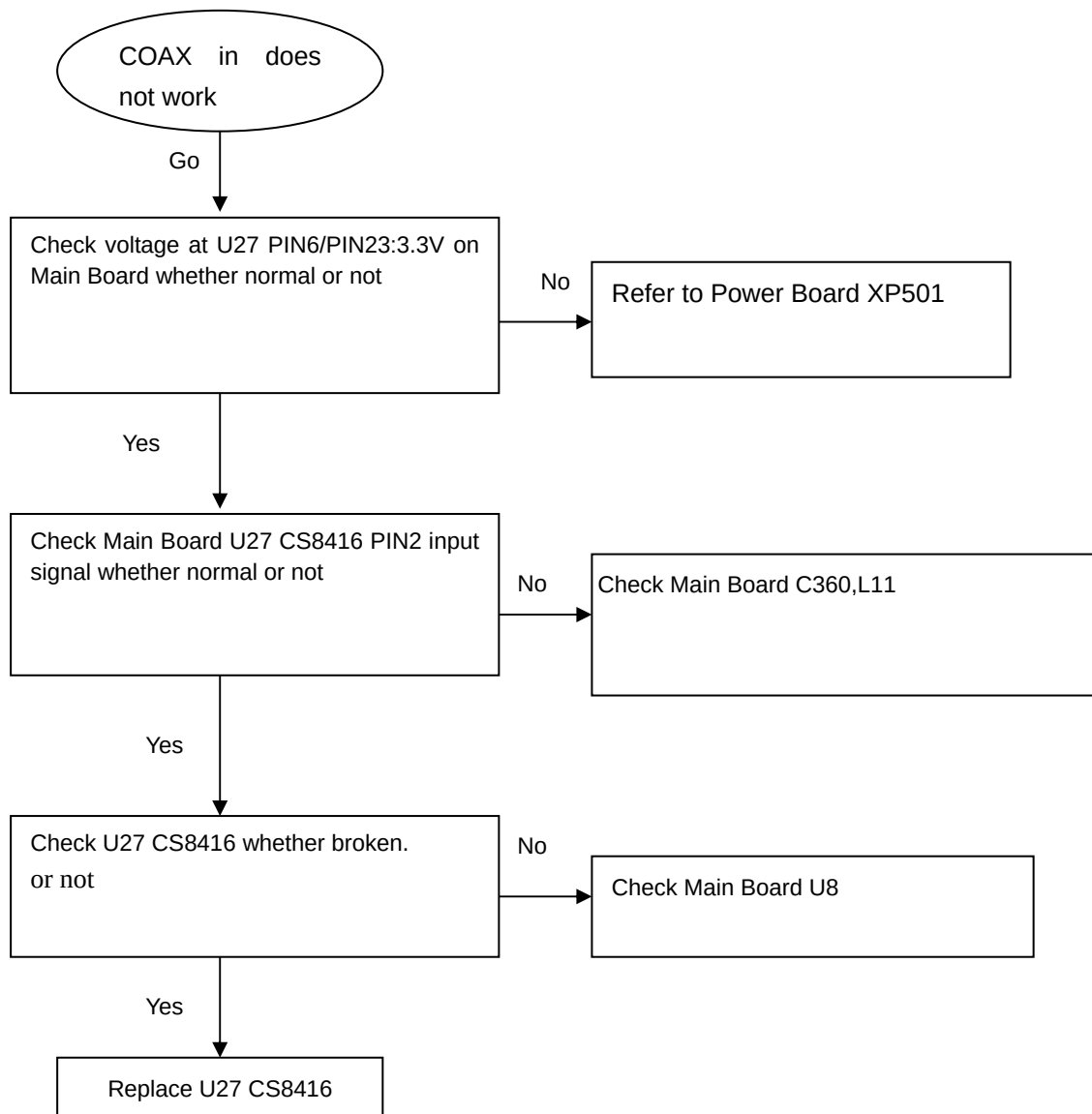
No video output

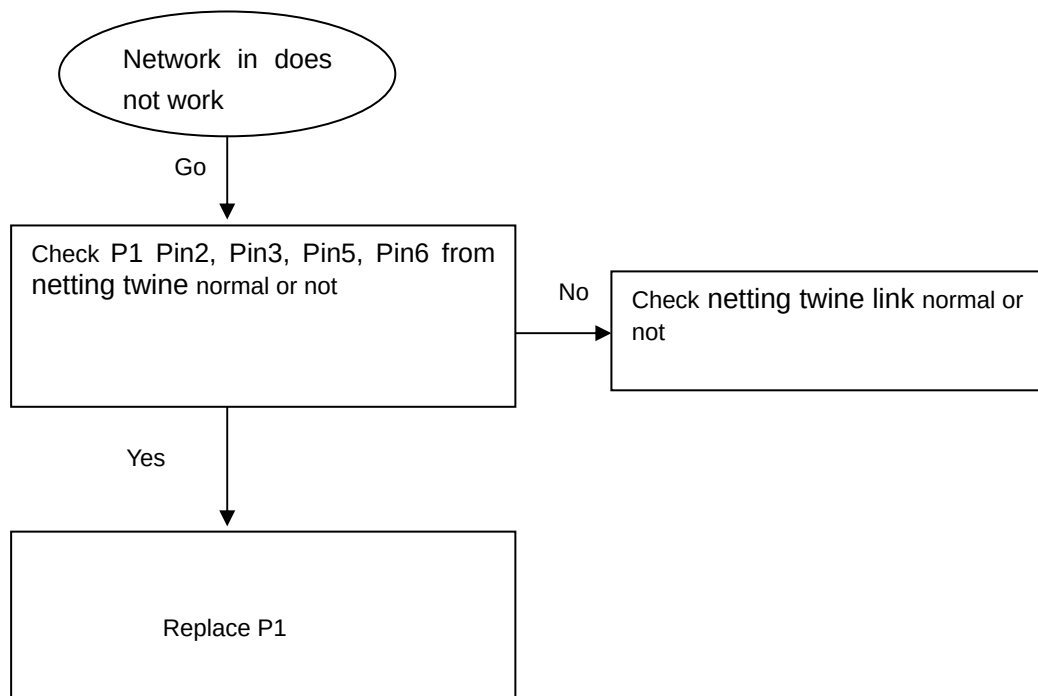
Can't read disc or can't open the disk door

Tuner FM does not work

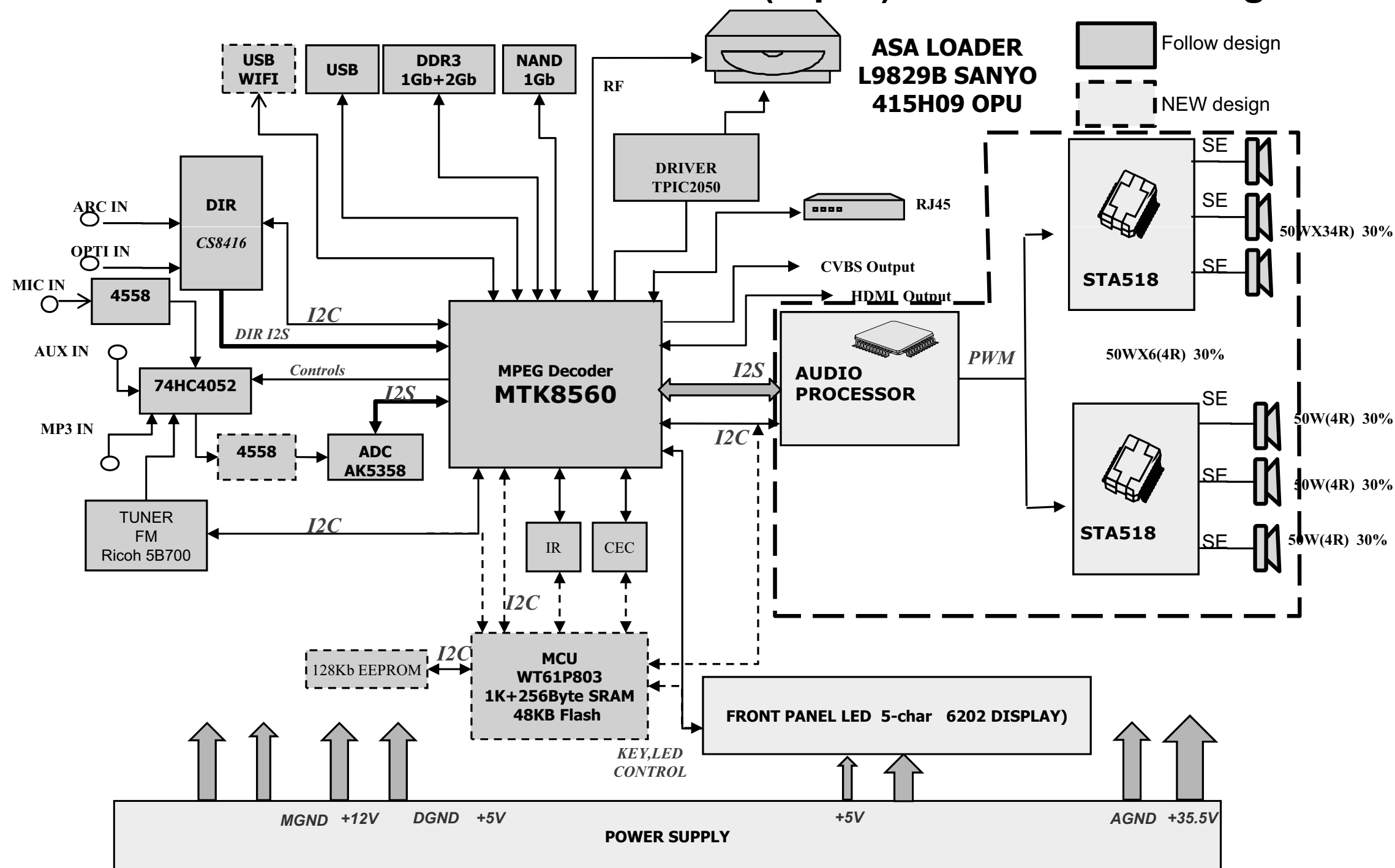
AUX in does not work

MP3 Link does not work

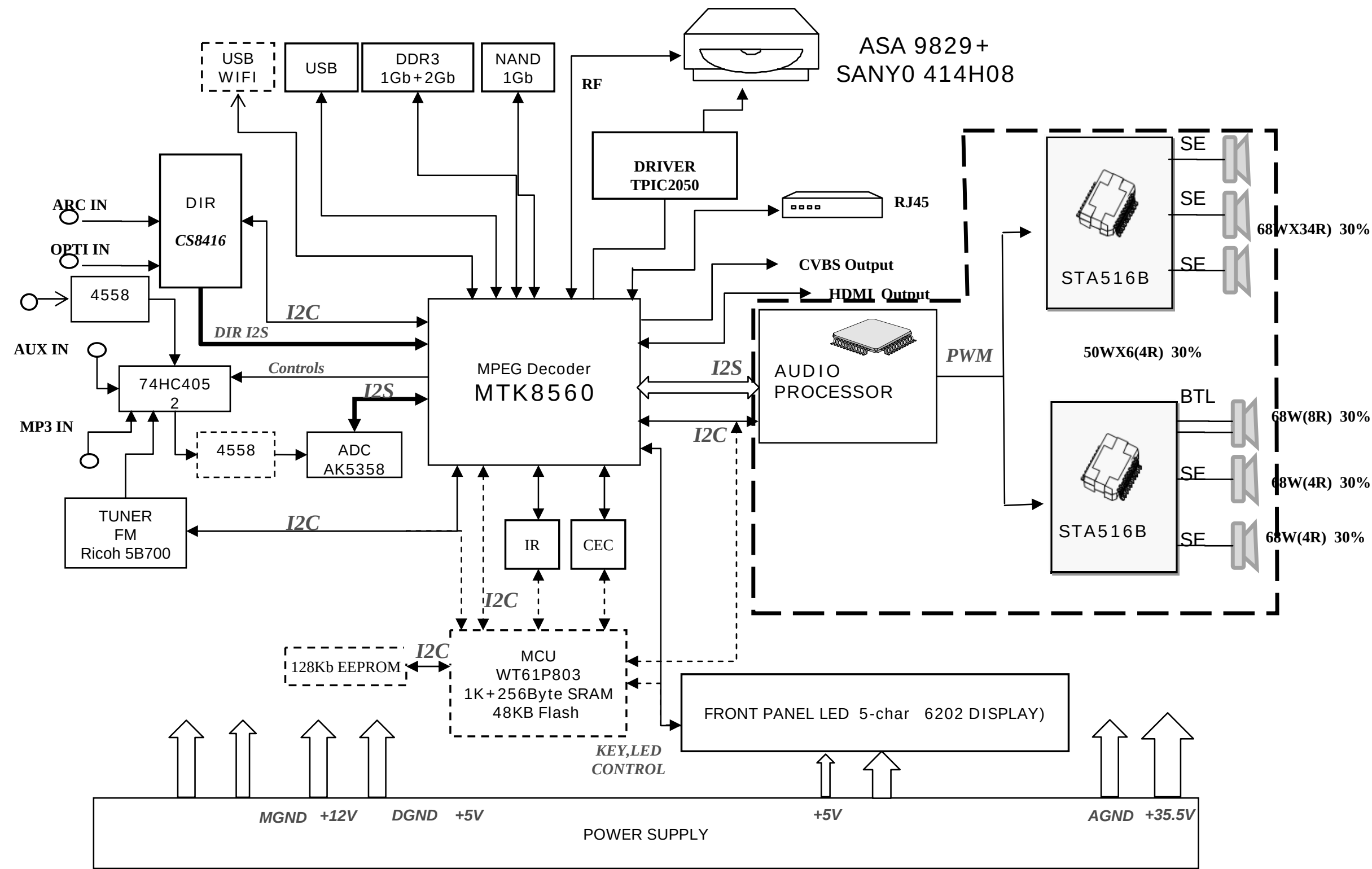
COAX in does not work

Network in does not work

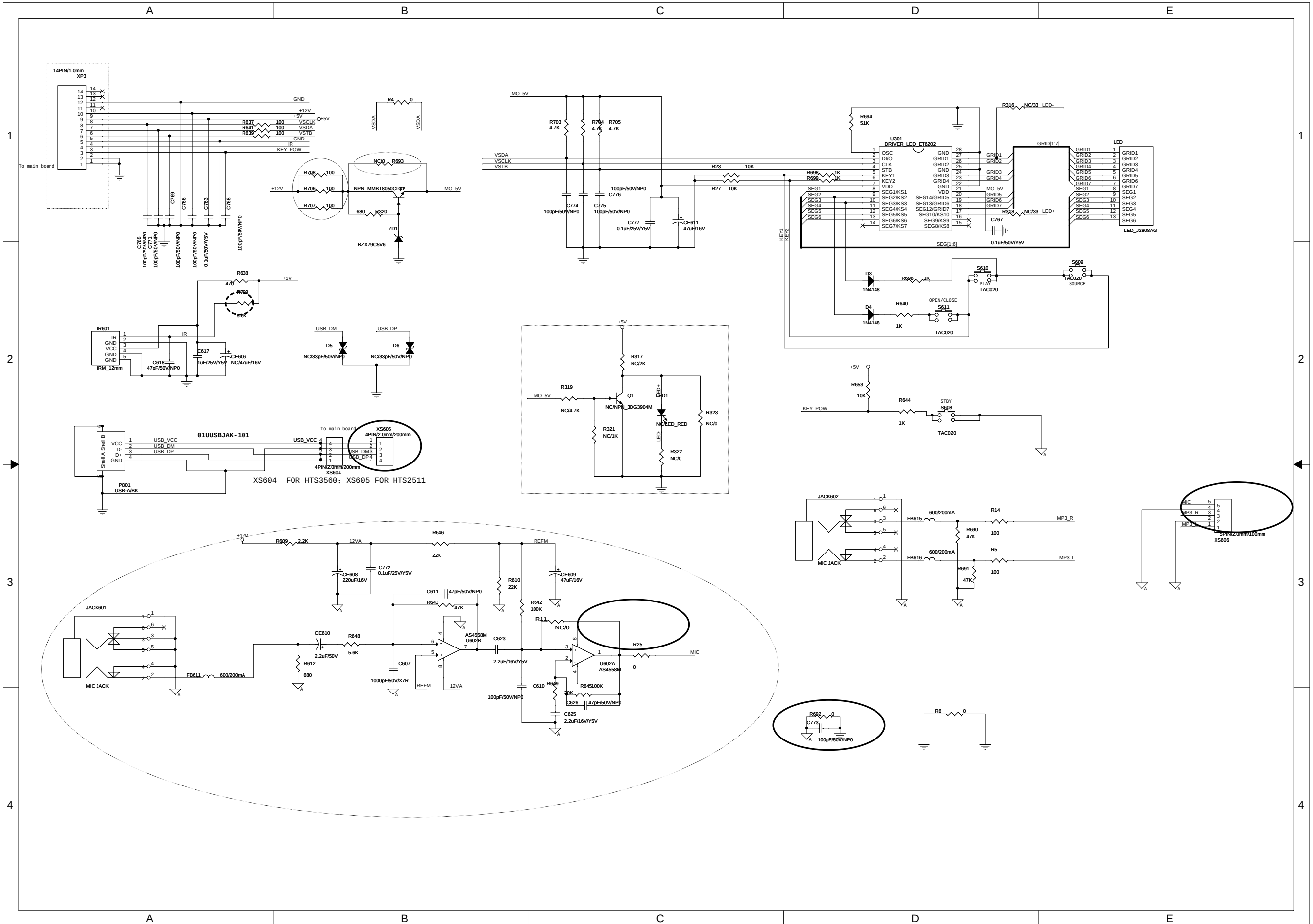
HTB3560/12/K98/94/40/55 BD HTS 300W (Equal)30%THD Block Diagram Draft



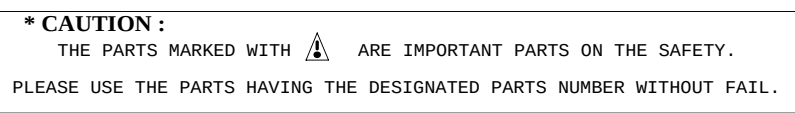
HTB3560/78 BD HTS400W (Equal)30%THD Block Diagram Draft

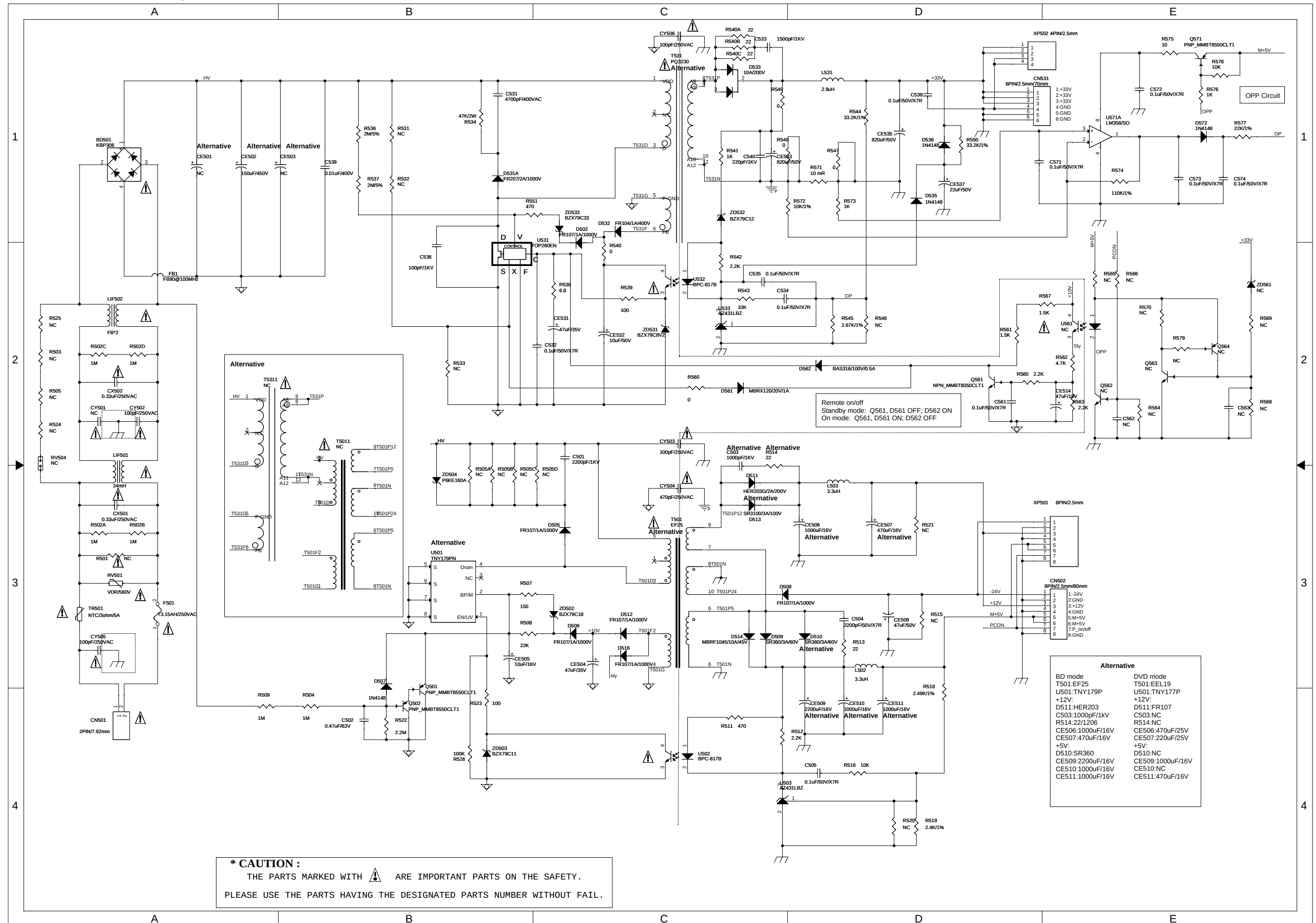


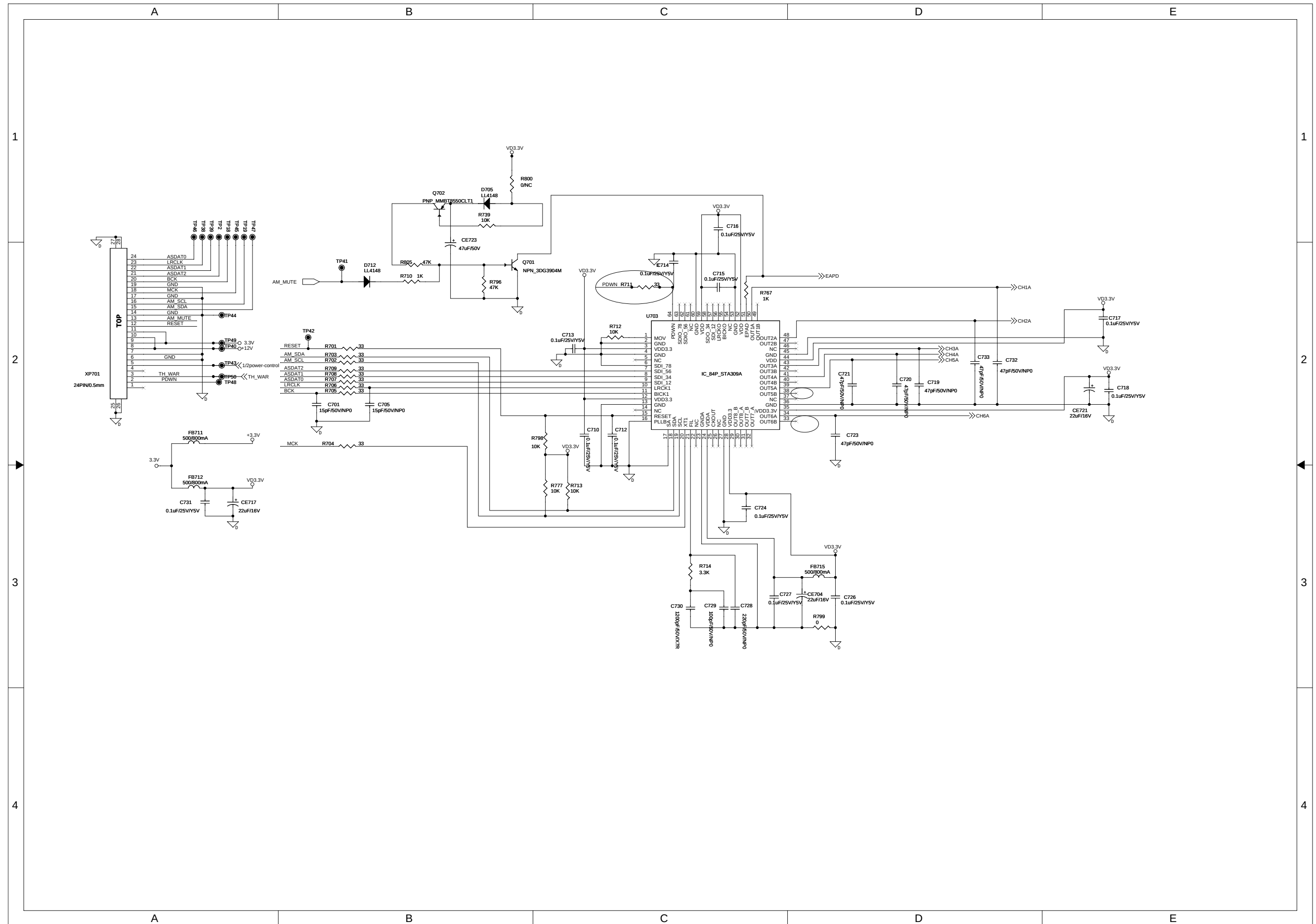
Front Board Circuit Diagram :



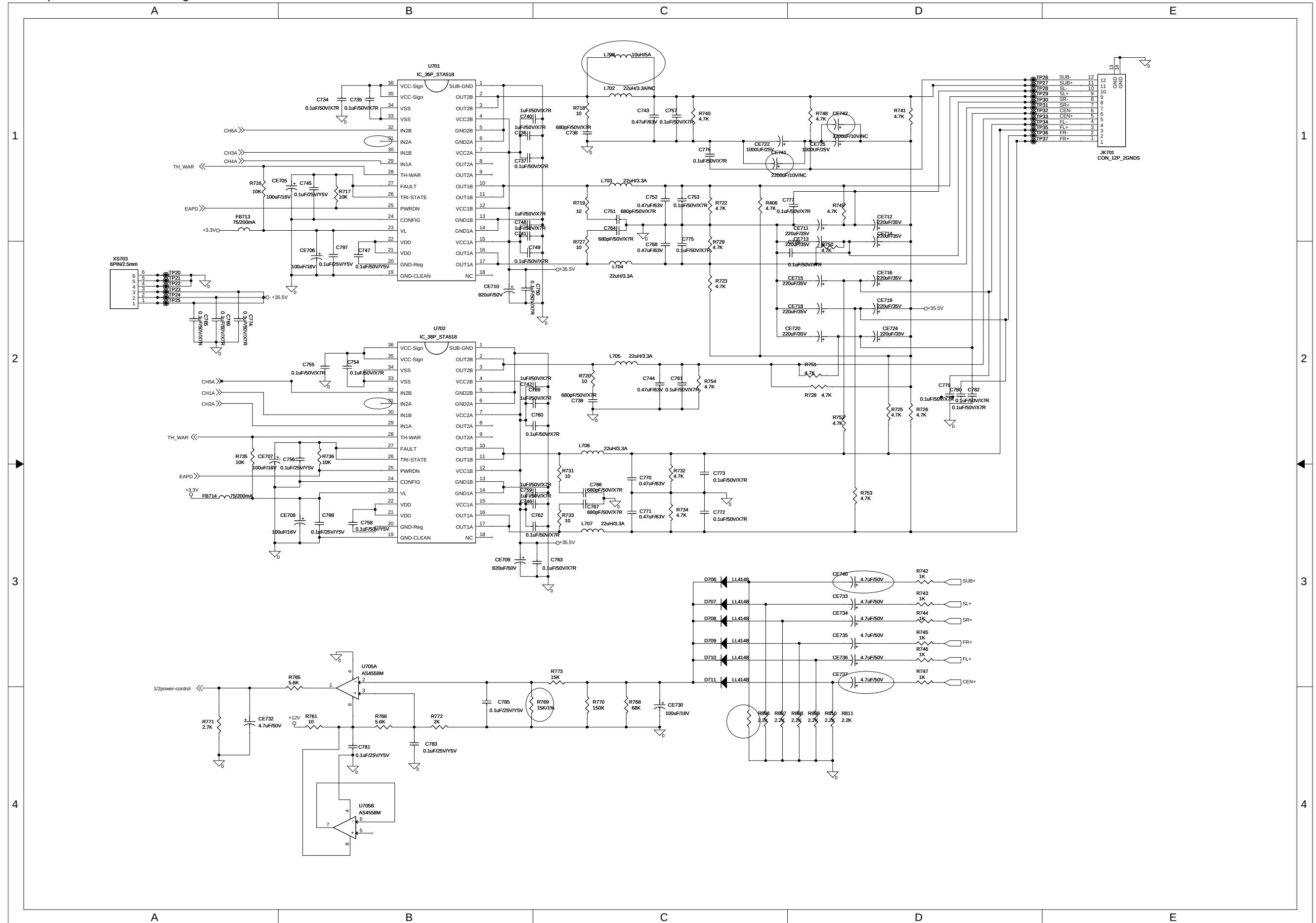
4



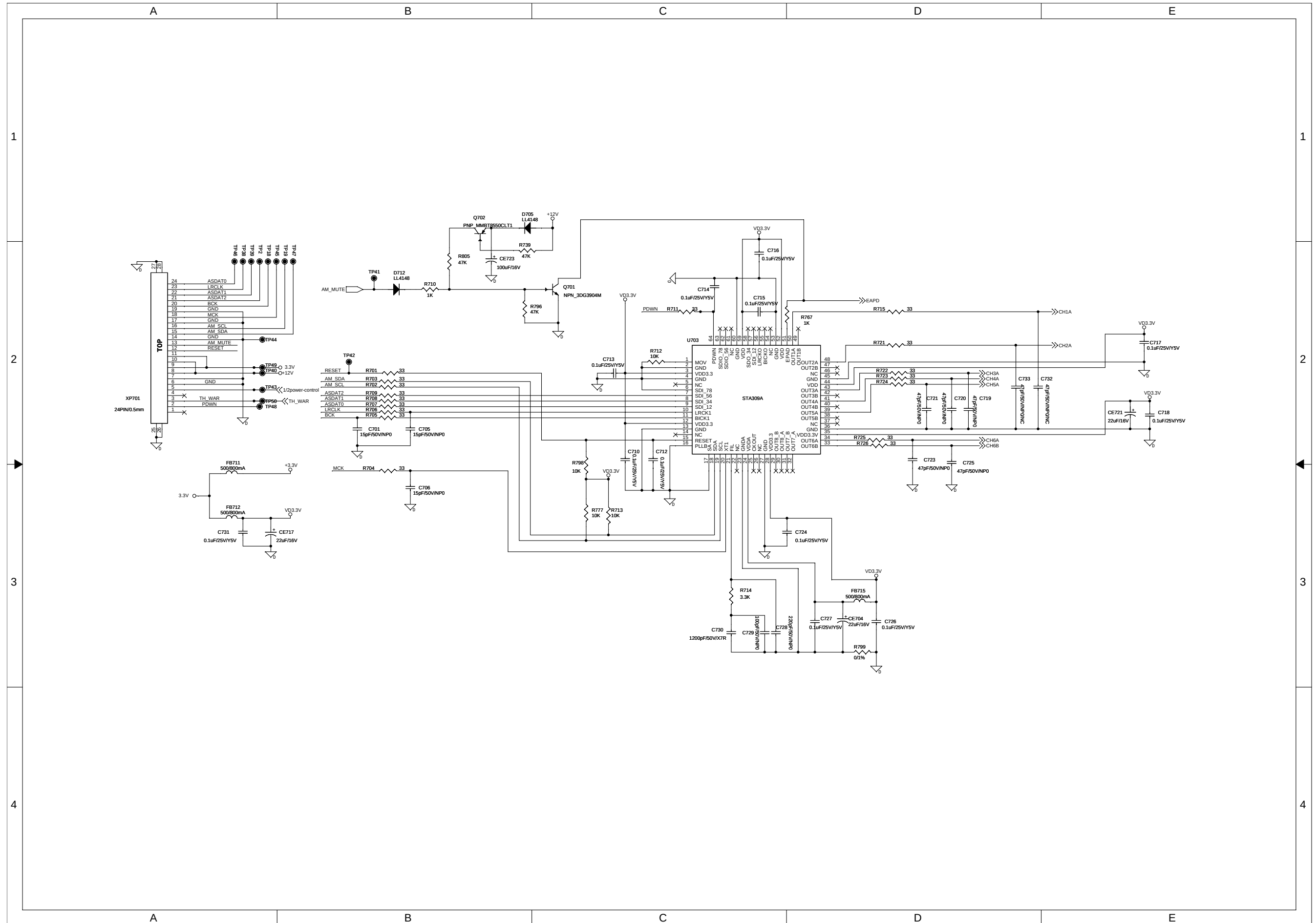


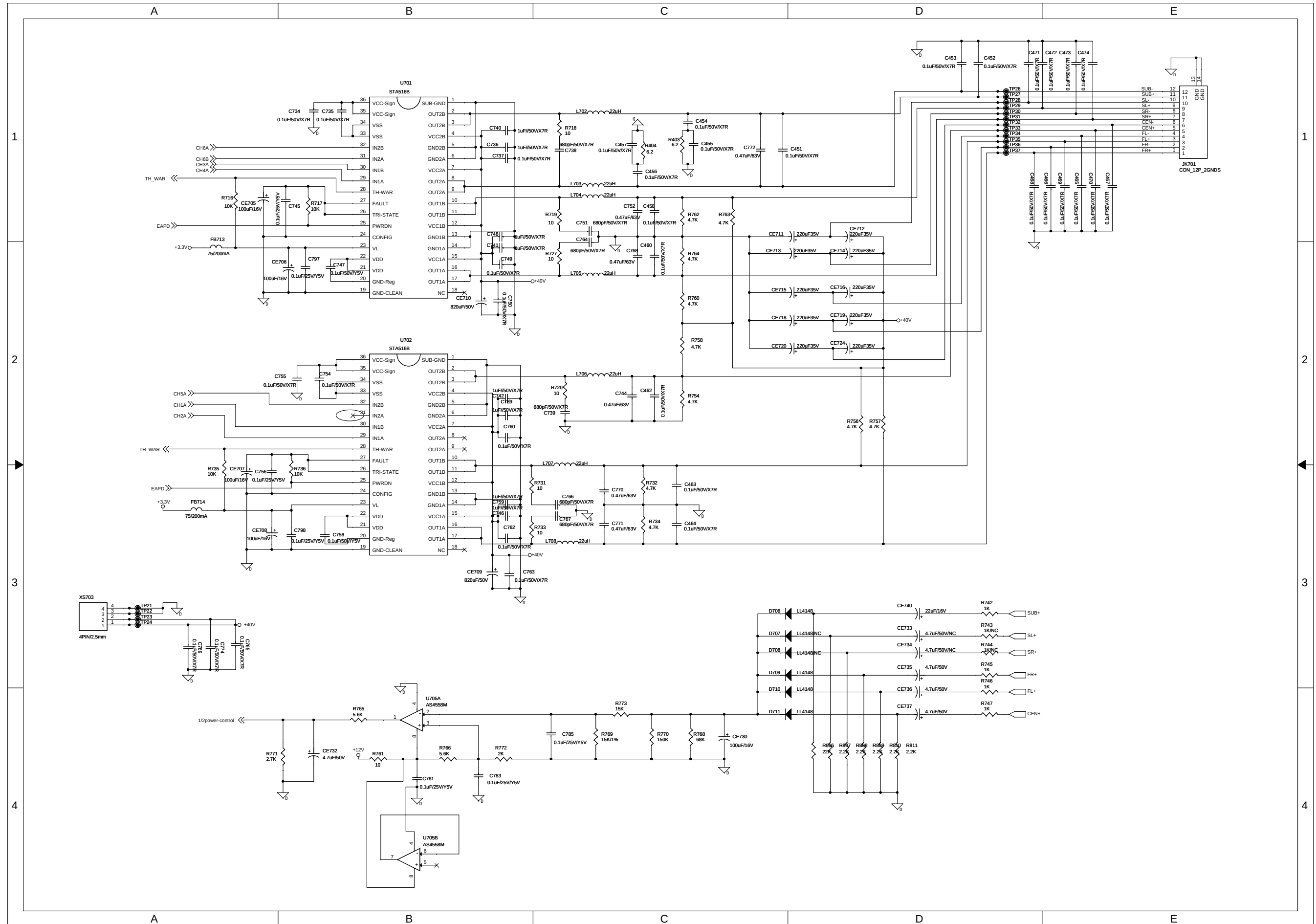


Amplifier Board Circuit Diagram for HTB3560/12/K98/94/40/55:STA518

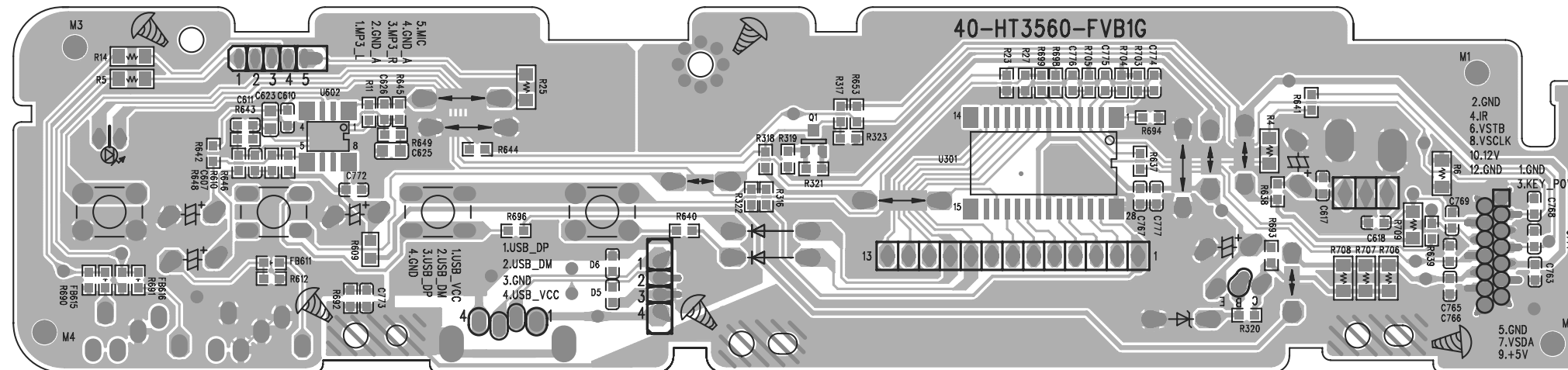


Amplifier Board Circuit Diagram for HTB3560/78:STA309A

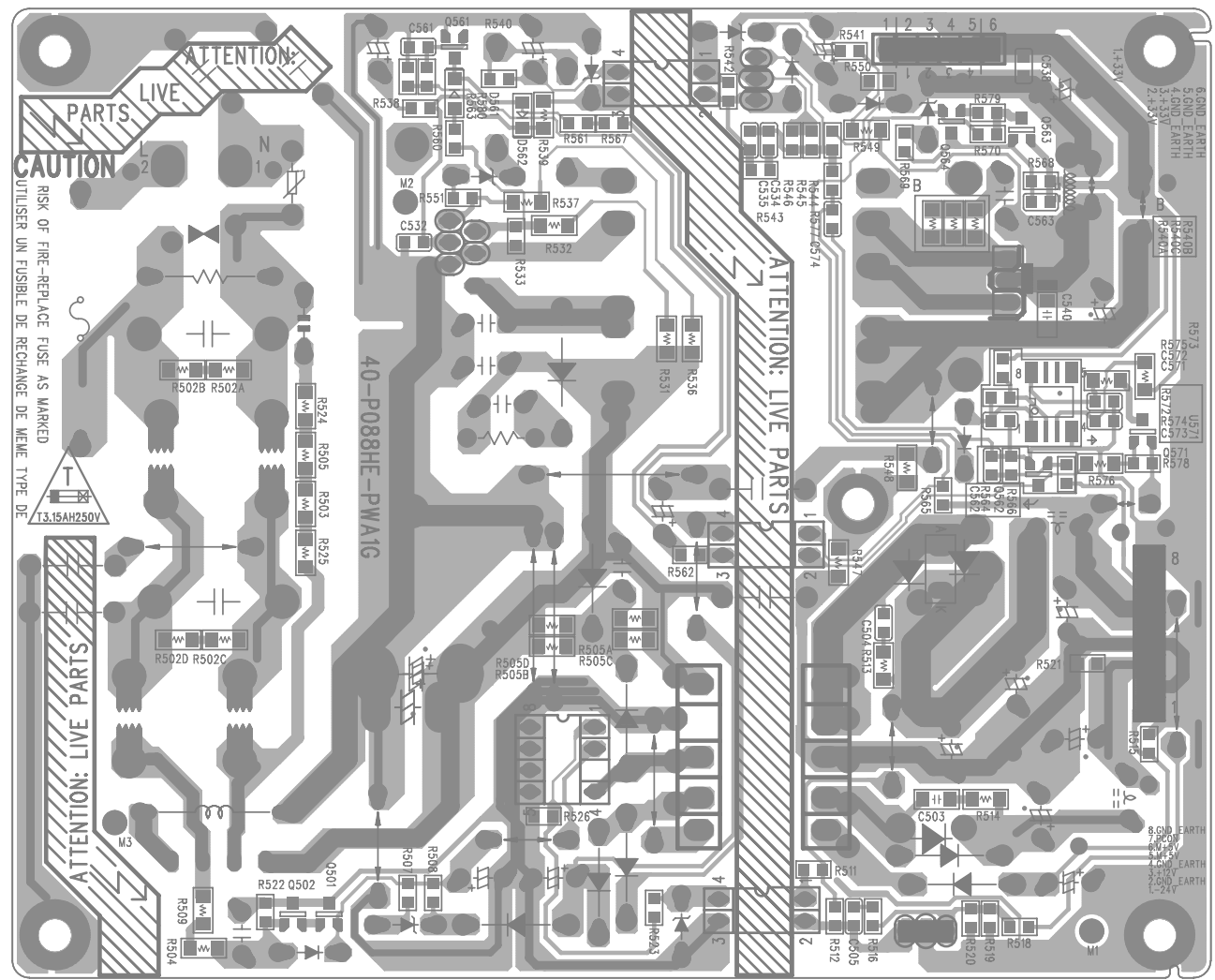




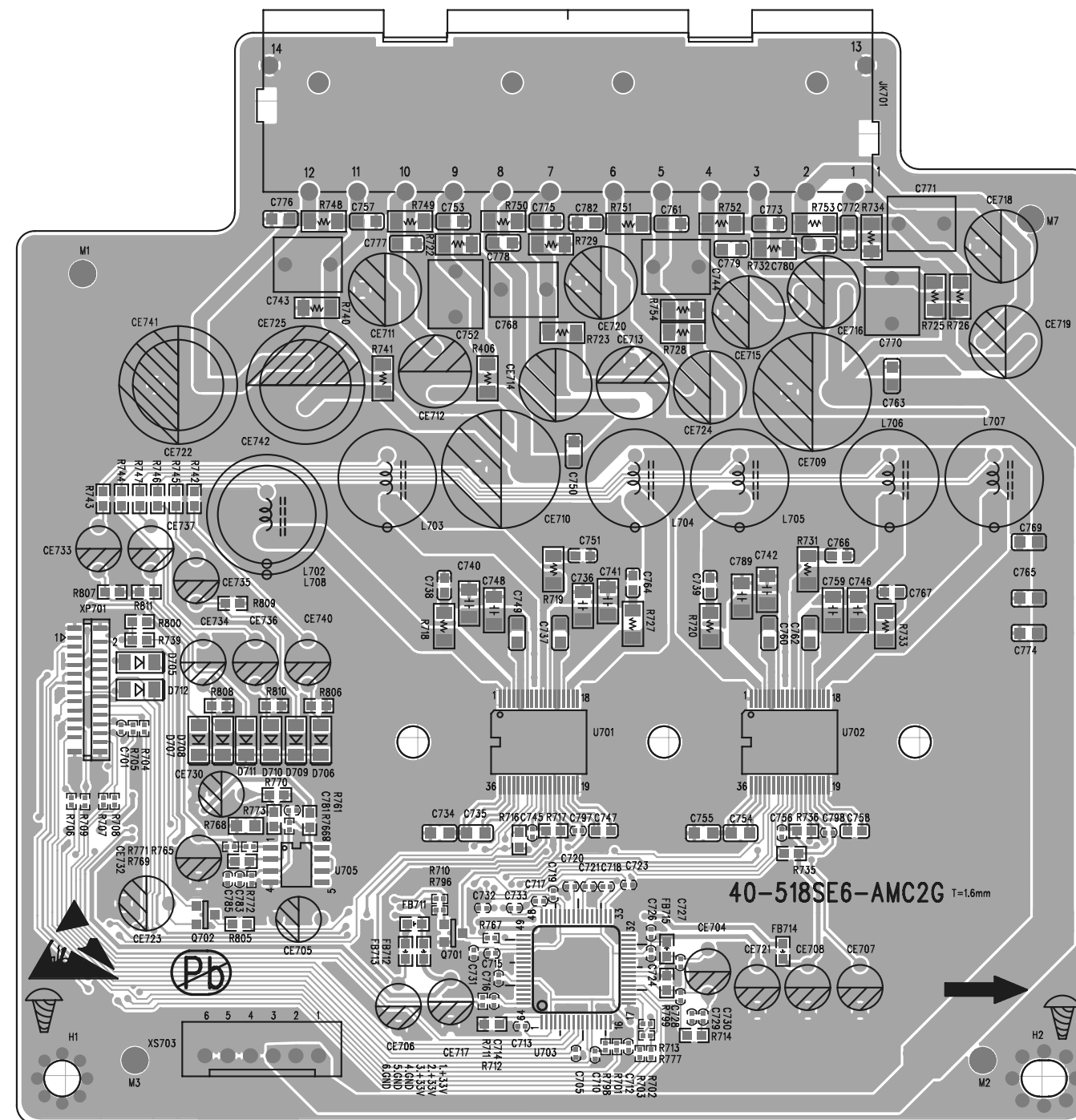
Front Control Board Print-layout (top side):



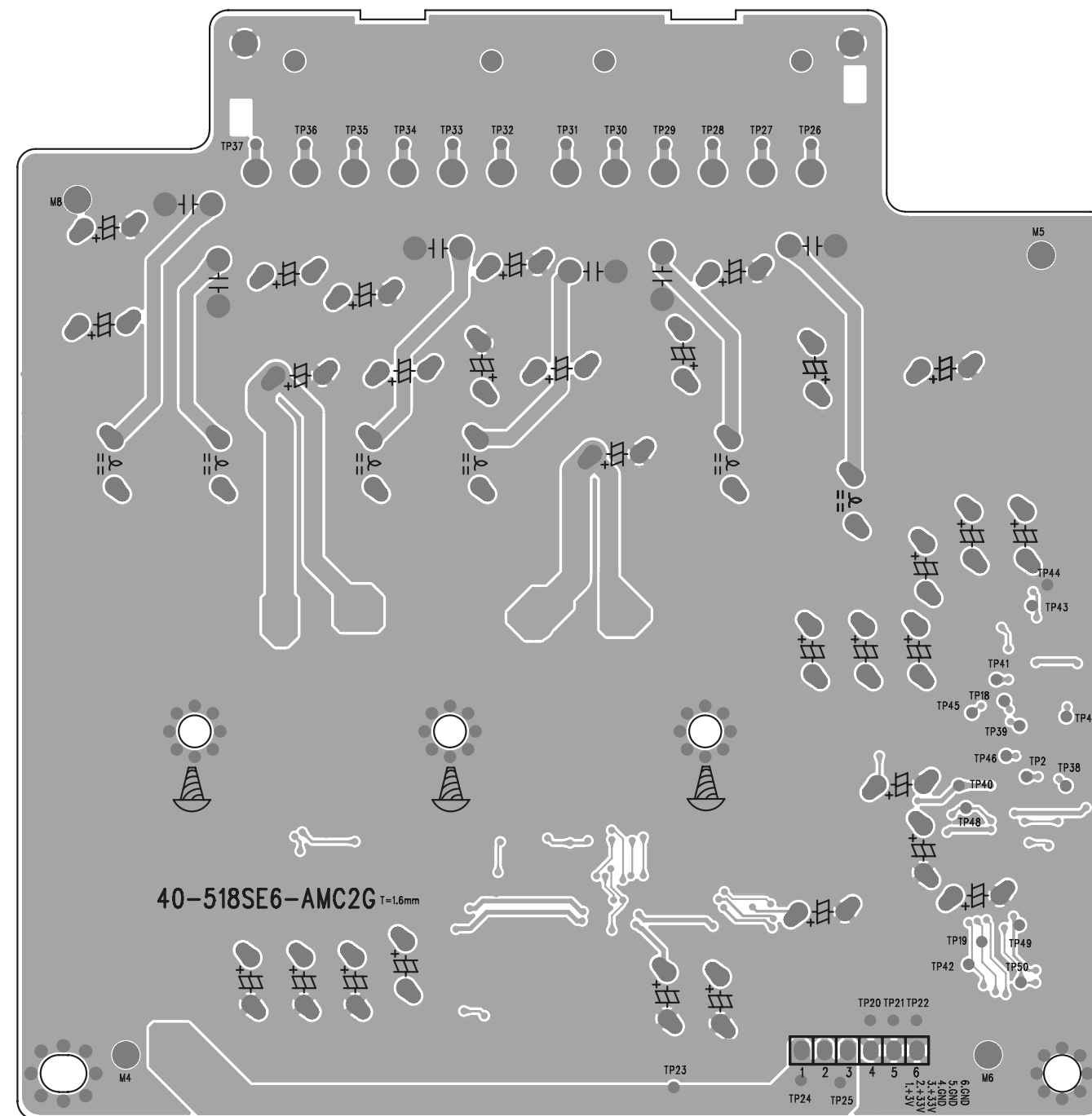
Power Supply Print-layout (top side) for HTB3560/78:



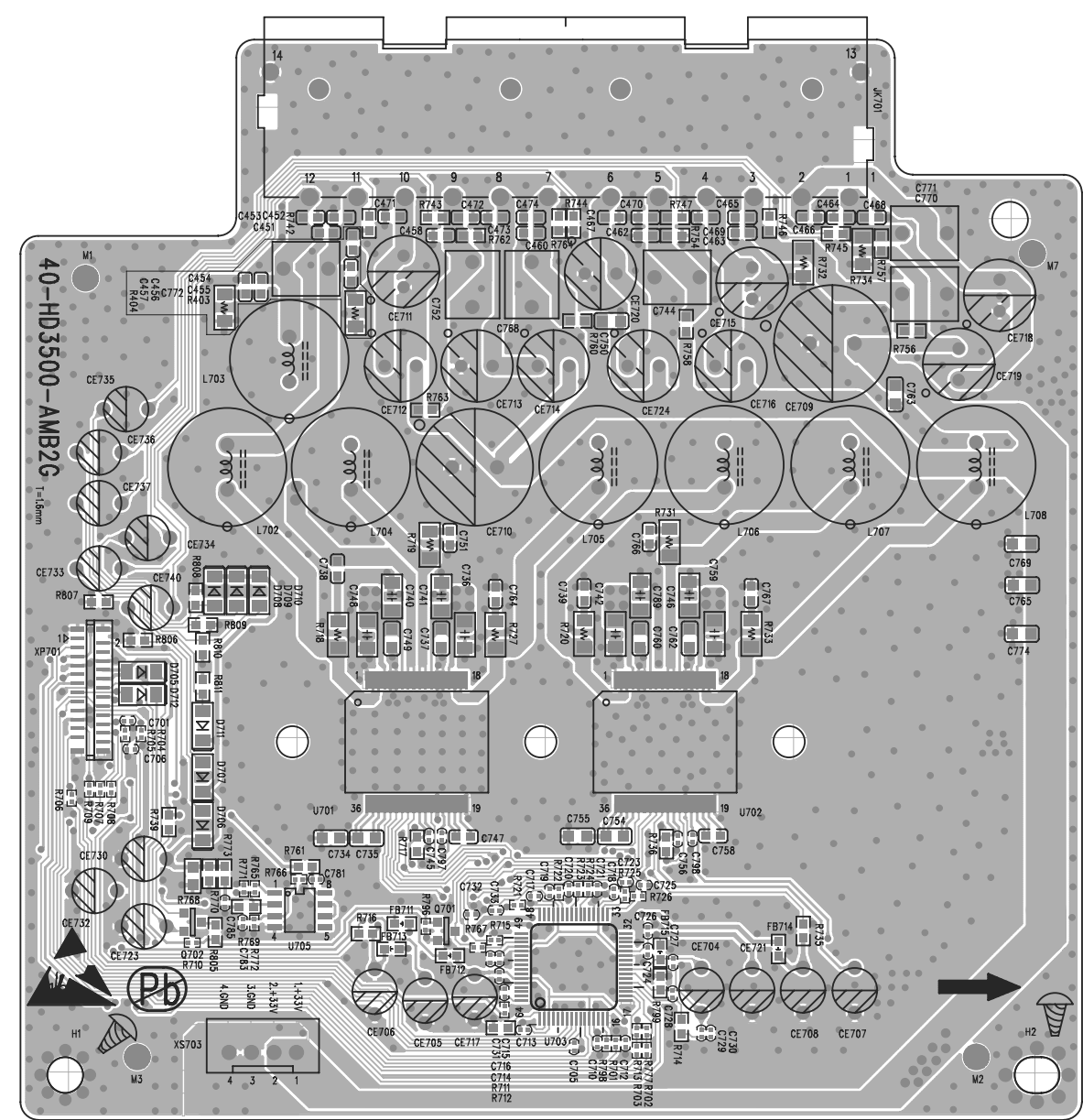
Amplifier Board Print-layout (top side) for HTB3560/12/K98/94/40/55:



Amplifier Board Print-layout (bottom side) for HTB3560/12/K98/94/40/55:



Amplifier Board Print-layout (top side) for HTB3560/78:



Voltages for per connection pin

P9--From Main Board Connect to Front Board

Pin No	Pin Assin	Remarks
1	Reserved	
2	Reserved	
3	GND	
4	-24V_D	
5	12V	11.4-12.6V
6	VCC	4.75-5.25V
7	VFD_CLK	SPI
8	VFD_DATA	
9	VFD_STB	
10	GND	
11	IR_OUT	
12	POWER_KEY	3.3V
13	GND	
14	GND	

XP13--From Main Board Connect to Amp Board

Pin No	Pin Assin	Remarks
1	DATA0	I2S
2	LRCKL	
3	DATA1	
4	DATA2	
5	BCLK	
6	GND	
7	MCLK	I2S
8	GND	
9	AMP_SCL	IIC
10	AMP_SDA	
11	GND	
12	AMP_MUTE	
13	AMP_RST	
14	3.3V	3.2-3.4V
15	+12V_D	11.4-12.6V
16	3.3V	3.2-3.4V
17	+12V_D	11.4-12.6V
18	GND	
19	GND	
20	POWER_derating	
21	Reserved	
22	TH_WAR	
23	PDWN	
24	BKND_ERR	

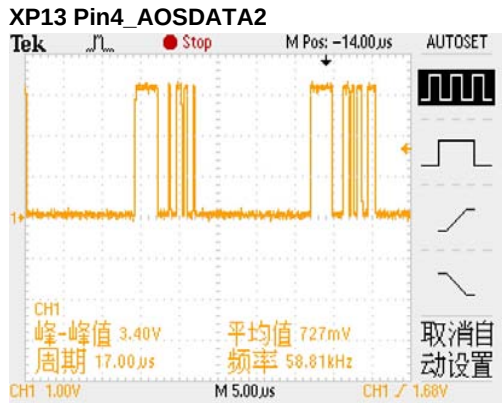
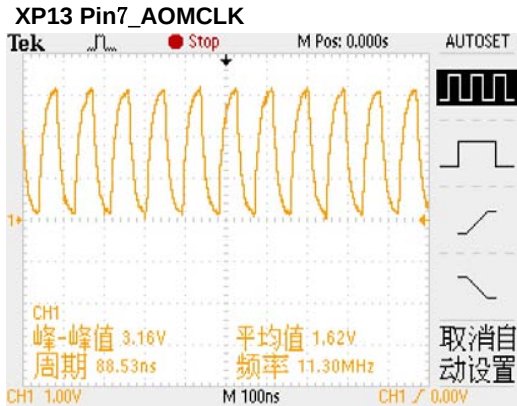
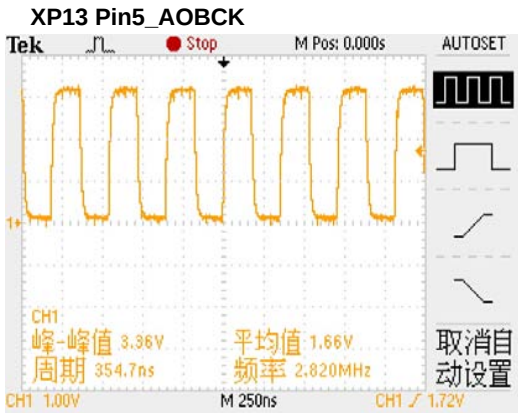
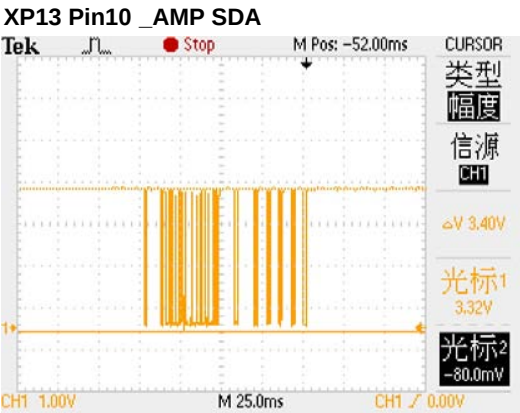
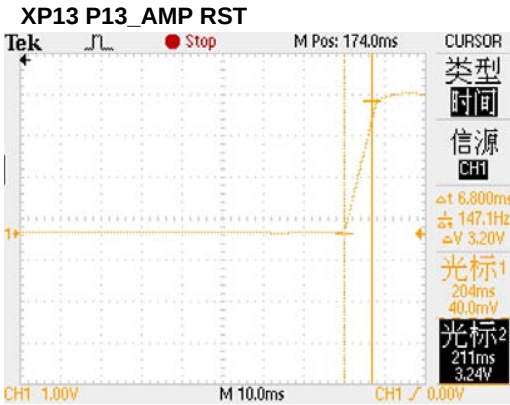
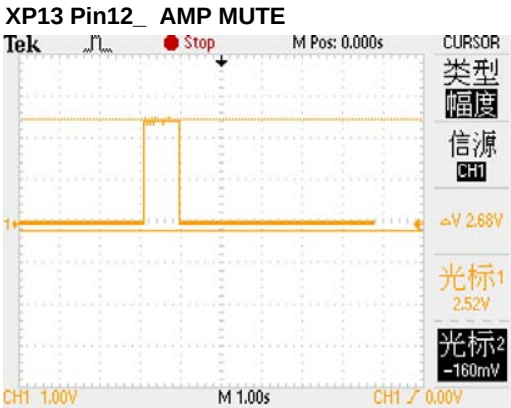
XP1--From Main Board Connect to Power Board

Pin No	Pin Assin	Remarks
1	-24V	22.8V-25.2V
2	GND	
3	+12V	11.4-12.6V
4	GND	
5	VCC	4.75-5.25V
6	VCC	4.75-5.25V
7	VCC_D	4.75-5.25V
8	GND	

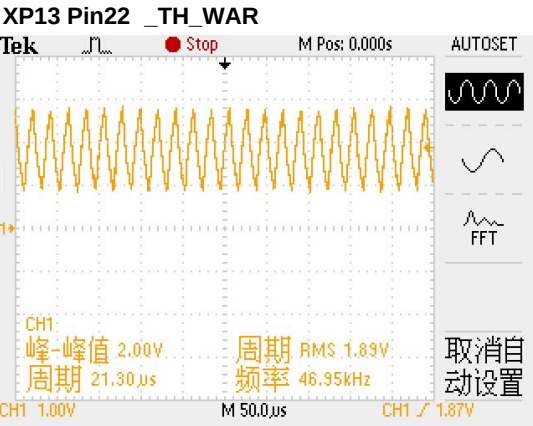
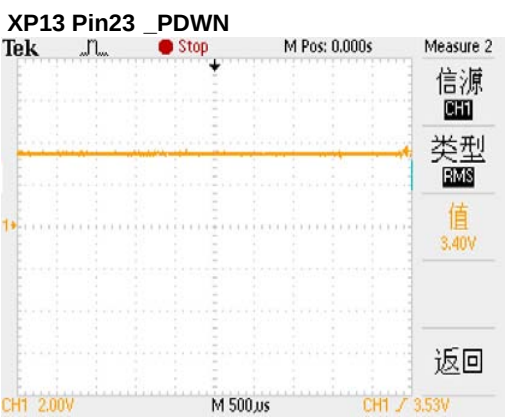
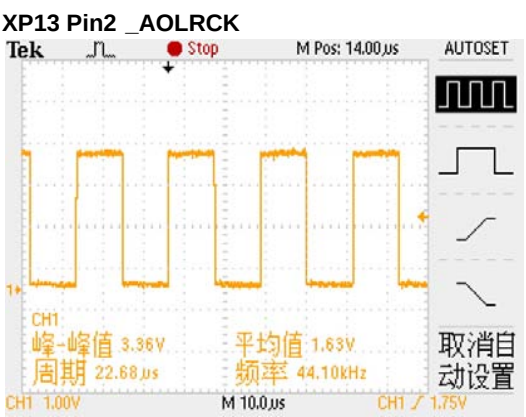
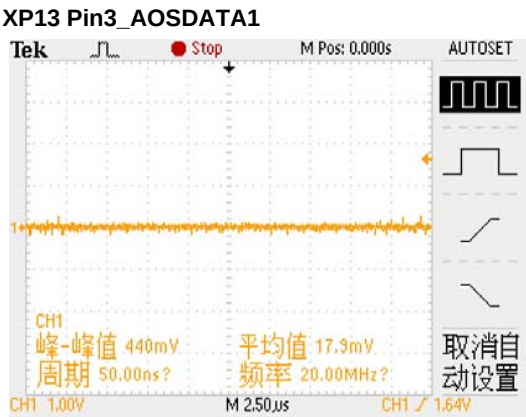
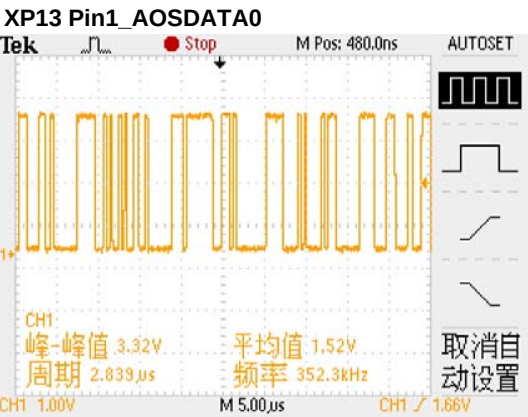
XP6--From Main Board Connect to Front USB

Pin No	Pin Assin	Remarks
1	USB_VCC	4.75-5.25V
2	GND	
3	USB_M1	High spped difference
4	USB_P1	

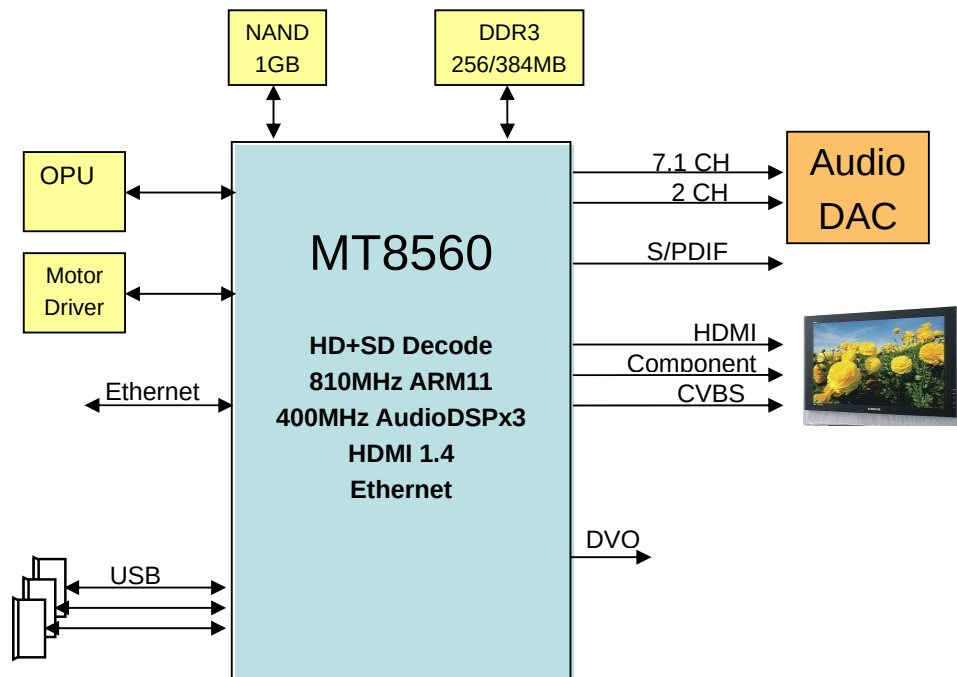
Waveforms for measure point



Waveforms for measure point



U1 Main IC-MT8560_BAAG Functional Block Diagram

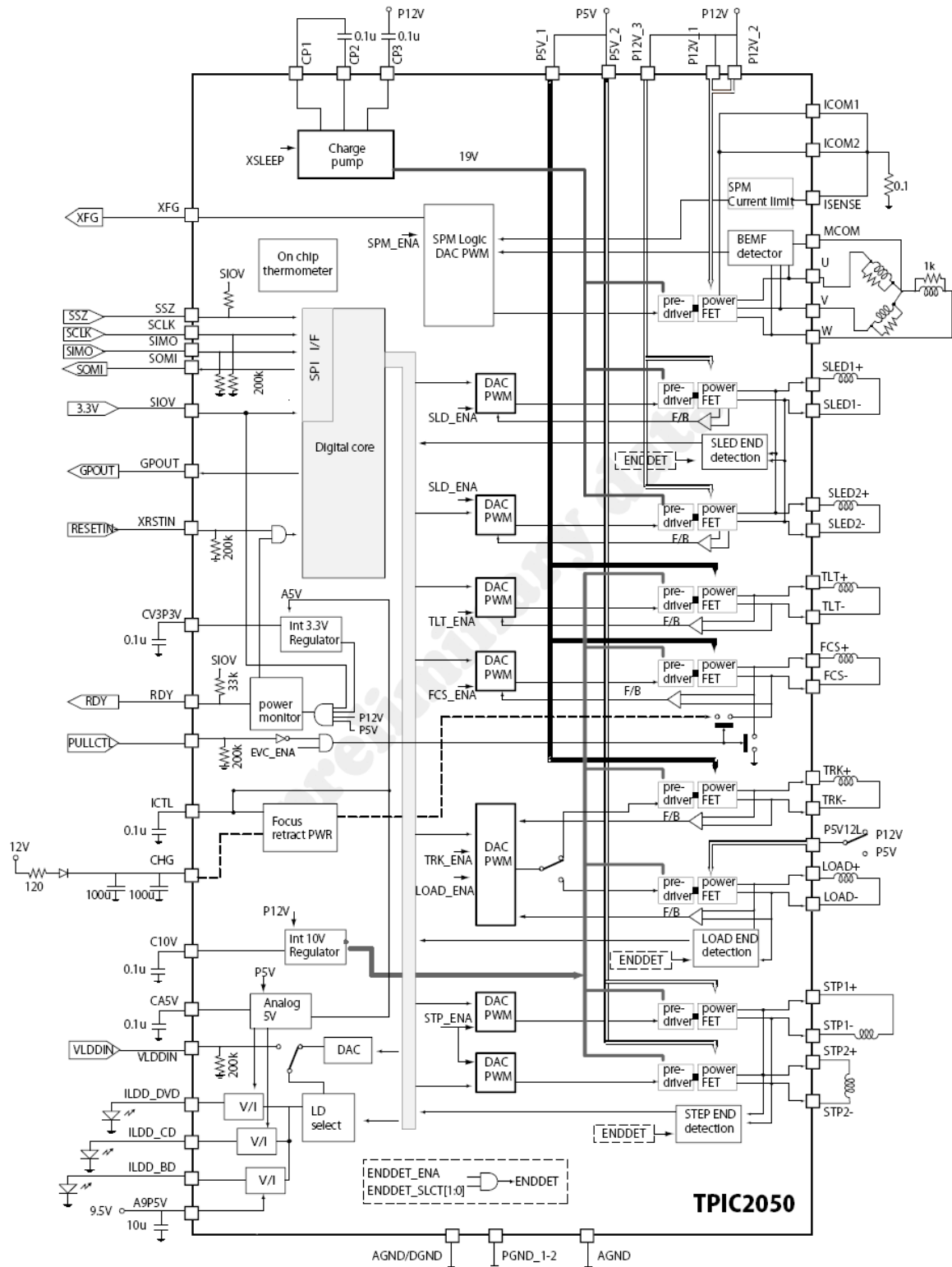


U1 Main IC-MT8560_BAAG Pin Assignment

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25					
A	TRINC	TRINA	FPDOD	VWDC3_O	TXVN_0	TXVN_1	SPDIF			AL0	NS_XTA_LO		CH2_M	CH1_M	CH0_M	CLK_M		VDACB_OUT	CEC		RESET_	VSAR	VDATA	VOUTD_14	VOUTD_12	A				
B	INB	TRIND	TRINB	FVREF	TXVP_0	TXVP_1	REXT			AR0	NS_XTA_LO		CH2_P	CH1_P	CH0_P	CLK_P		VDACX_OUT	HDMISD	HDMISC_K	OPWRS_B	IR	VFB	VOUTD_13	VOUTD_10	B				
C	IND	INC	INA	FPDOD_VD		VWDC2_O	AOSDA_TA4	AOSDA_TA2	AOSDA_TA1	AOLRG_K			AVDD33_HDMI_C	AVDD33_HDMI_D	AVDD012_HDMI_C	AVDD012_HDMI_D	VDACR_OUT	VDACG_OUT		HTPLG			GPI02	VOUTD_11	VOUTD_8	C				
D	ING	INH					AOSDA_TA3			AOSDA_TA0			AVDD33_DAC		AVDD033_HDMI	AVDD033_HDMI_R							GPI09	DVCC33_IO_STB	LCORD	VOUTD_9	VOUTD_6	D		
E	INF	INE	AVDD33_1	HAVC	VDAC0	RST1			AVSS33_FLL	AVSS33_DAC			AVSS33_HDMI	AVSS33_HDMI	AVSS33_VDAC_R	AVSS33_VDAC_R							GPI01	UATXD	DVCC33_IO_STB	VOUTD_15	VOUTD_7	VOUTD_4	E	
F	MPXOU_T3	MPXOU_T2	MPXOU_T1	AUX1		AGND33_3			AVDD33_COM	AVSS33_REFS			AVSS33_LD		AVSS33_VDAC_R	AVSS33_VDAC_R							UARXD	DVCC33_IO	VOUTC_LK	VOUTD_5	VOUTD_2	F		
G	RFIP	RFIN							AVDD33_LD	AVDD33_REFS			AVSS33	AVSS33	AVSS33	AVSS33								DVCC33_IO	VOUTV_SYNC	VOUTD_3	VOUTD_1	VOUTD_0	G	
H	RFIP2	RFIN2	V14	FOO	AGND12_1	AGND12_2							DGND1_2_K			AVDD12_LDO								DGND1_2_K	VOUTH_SYNC		RCLK0	RCLK0_	H	
J		TR0	TLO	AVDD12_2		AVDD33_3			DVCC33_IO		DVCC33_IO													DORVC_O5	DGND1_2_K	RDQ0	RDQ0_	J		
K																								DGND1_2_K	RDQ1	RDQ1_	K			
L	FEQAIN_SW3	FEQAIN_SW1	FEQMO	FEQFR_EQ	DGND1_2_K	DGND1_2_K	DGND1_2_K	DVCC33_IO	DVCC12_2_K	DGND1_2_K	DGND1_2_K	DGND1_2_K	DGND1_2_K	DGND1_2_K	DGND1_2_K	DGND1_2_K	DVCC12_2_K	DVCC12_2_K	DORVC_O5	DORVC_O5	DORVC_O5	DORVC_O5	DGND1_2_K	RDQ14	RDQ13			L		
M		FEQAIN_SW2	FEFM04						DGND1_2_K	DGND1_2_K			DGND1_2_K												RDQ15	RDQ12			M	
N	FEFM0	FEFM02	FEFM03	DGND1_2_K	FEQIO5	FEQIO7	FEQIO8			DGND1_2_K	DGND1_2_K		DGND1_2_K		DGND1_2_K	DGND1_2_K	DVCC12_2_K	DVCC12_2_K	DORVC_O5	DORVC_O5	DORVC_O5	DORVC_O5	DGND1_2_K	DGND1_2_K	RDQS1_	RDQS1_	N			
P		FETRAY_PWM	FEDM0						DVCC12_2_K	DGND1_2_K	DGND1_2_K		DGND1_2_K		DGND1_2_K	DGND1_2_K	DGND1_2_K	DVCC12_2_K	DORVC_O5	DORVC_O5	DORVC_O5	DORVC_O5			RDQS0_	RDQS0_	P			
R	FEFG	FEQIO9	FEQIO1	DGND1_2_K	FEQIO9	FEQIO4				DGND1_2_K	DGND1_2_K	DGND1_2_K	DGND1_2_K	DGND1_2_K	DGND1_2_K		DVCC12_2_K							DORVC_O5	RDQM1	RDQM0			R	
T	FEEJEC_T_	FETRAY_IN	FEQIO1_0							DVCC12_2_K	DVCC12_2_K	DVCC12_2_K	DVCC12_2_K		DVCC12_2_K	DVCC12_2_K	DORVC_O5							DGND1_2_K	RDQ6	RDQ6_	RDQ1_		T	
U	FEQIO1_1	FEQIO3	USB_VR_T	FETRAY_OUT	AMUTE	DGND1_2_K				DVCC12_2_K	DVCC12_2_K	DVCC12_2_K	DVCC12_2_K	DVCC12_2_K	DVCC12_2_K									RA1	DGND1_2_K	RDQ3		RDQ2	U	
V	USB_DP_P2	USB_D_M_P2				DGND1_2_K											DORVC_O5	DORVC_O5	DORVC_O5	DORVC_O5	DORVC_O5	DORVC_O5			RA11	RDQ1	RDQ0		V	
W	USB_DP_P0	USB_D_M_P0															DORVC_O5	DORVC_O5	DORVC_O5	DORVC_O5	DORVC_O5	DORVC_O5			RA8			RDQ1	RRAS_	W
Y	USB_DP_P1	USB_D_M_P1															DGND1_2_K	DORVC_O5	DORVC_O5	DORVC_O5	DORVC_O5	DORVC_O5			DGND1_2_K			RCS_	RBA0	Y
AA	SCL	SDA	AVDD33_USB	GPI04	GPI03	RCKE_B		RA0_B		RA1_B		RWE_B		RDQM1_B										DGND1_2_K	RA12	TP_ME_MPLL	RA3	RA5	RA0	AA
AB	GPI05	GPI06	NFD6					RA0_B		RA1_B		RA13_B		DGND1_2_K	RDQ1_B	RDQ1_B	RDQM0_B							AVSS33_MEMPL_L			TP_ME_MPLL	RA7	RA2	AB
AC	NFD7	NFD4	NFD0					RA5_B		RA0_B		RA2_B	RDQ0_B	RDQ1_B		RDQ1_B	RDQ1_B	RDQ1_B	RDQ1_B	RDQ1_B	RDQ1_B	RDQ1_B	DGND1_2_K	RDQ1_B	RDQ7_B	RDQ5_B		RA9	RRESET	AC
AD	NFD5	NFD2	NFRBN	NFCEN	NFCLE	NFWEN	RA9_B	RA7_B		RDQ1_B			RDQ2_B				RDQ2_B	RDQ2_B	RDQ2_B	RDQ2_B	RDQ2_B	RDQ2_B	RDQ2_B	RDQ2_B	RDQ2_B	RDQ2_B	RDQ2_B	RDQ2_B	RDQ2_B	AD
AE	NFD3	NFD1	NFRBN	NFCEN	NFCLE	NFWEN	RA9_B	RA7_B		RCS_B		RRAS_B		RDQ3_B											RDQ3_B	RDQ3_B	RDQ3_B	RDQ3_B	RDQ3_B	AE

U409 Motor Drivers IC- TPIC2050

1. Block Diagram



2. Pin assignment

1	SLED1_P	P5V_2	56
2	SLED1_N	STP2_N	55
3	P12V_3	STP2_P	54
4	SLED2_P	STP1_N	53
5	SLED2_N	STP1_P	52
6	PGND_2	AGND	51
7	C10V	ISENSE	50
8	CP1	MCOM	49
9	CP2	ICOM2	48
10	CP3	W	47
11	GPOUT	P12V_2	46
12	XFG	V	45
13	RDY	ICOM1	44
14	SSZ	U	43
15	SCLK	P12V_1	42
16	SIMO	PGND_1	41
17	SOMI	FCS_N	40
18	SIOV	FCS_P	39
19	XRSTIN	TRK_N	38
20	PULL_CTL	TRK_P	37
21	VLDDIN	TLT_P	36
22	CV3P3	TLT_N	35
23	AGND/DGND	P5V_1	34
24	A9P5V	CHG	33
25	ILDD_BD	ICTL	32
26	ILDD_DVD	P5V12L	31
27	ILDD_CD	LOAD_N	30
28	CA5V	LOAD_P	29

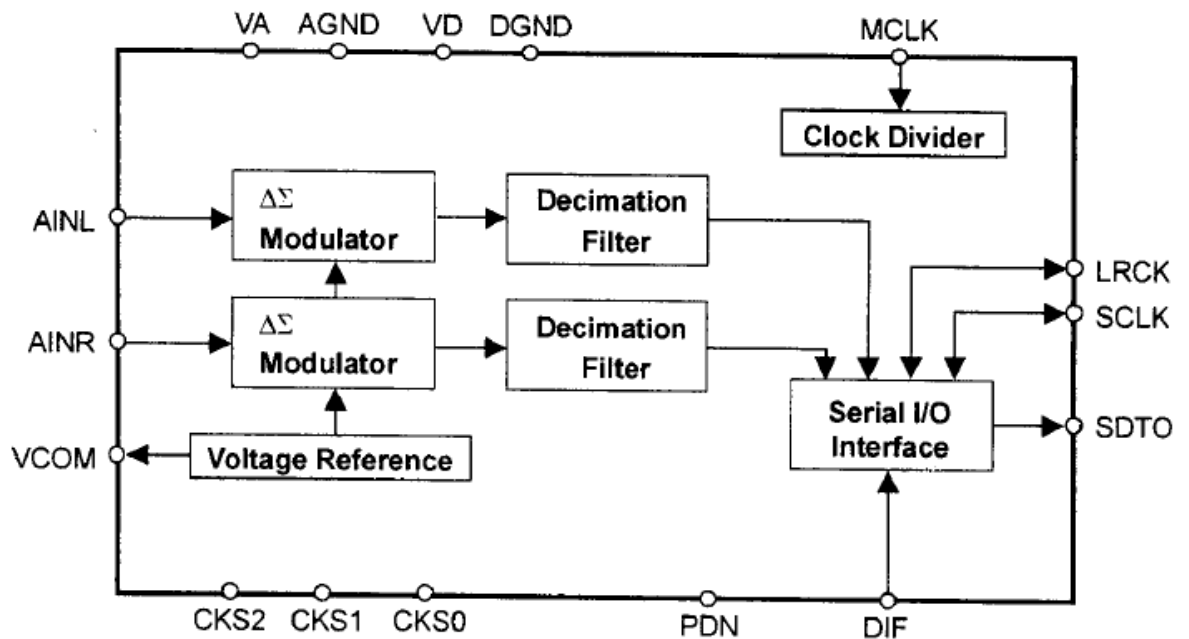
3. Pins definition

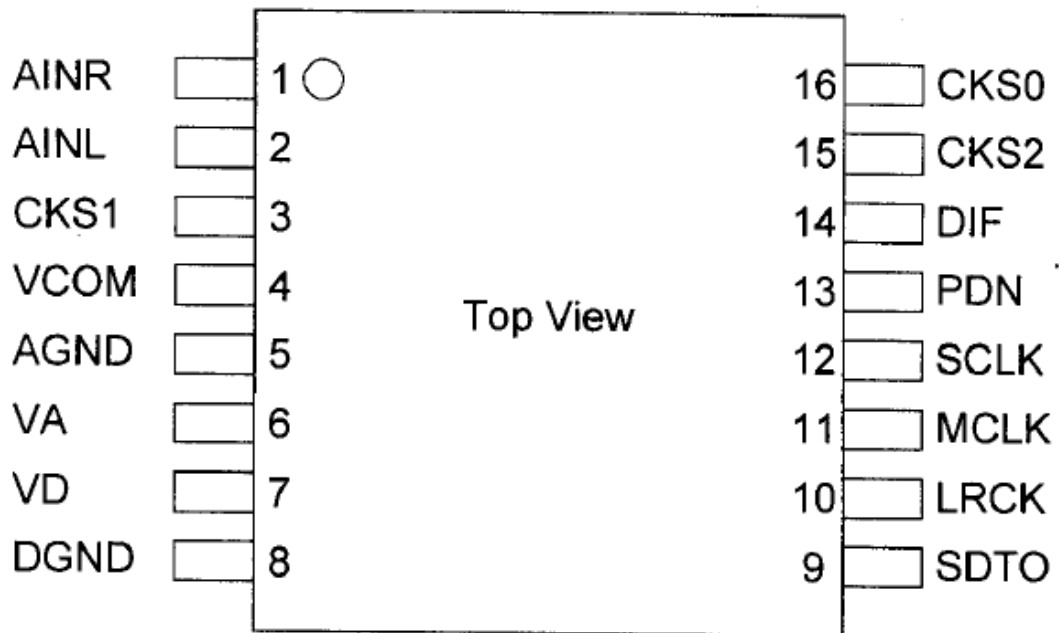
No	Name	I/O	description
1	SLED1_P	OUT	Sled1 positive output terminal
2	SLED1_N	OUT	Sled1 negative output terminal
3	P12V_3	PS	Power supply terminal for 12V drivers output
4	SLED2_P	OUT	Sled2 positive output terminal
5	SLED2_N	OUT	Sled2 negative output terminal
6	PGND_2	PS	GND terminal for 12V drivers
7	C10V	MISC	The capacitance connection terminal for internal regulator.
8	CP1	MISC	Capacitance connection for Charge Pump
9	CP2	MISC	Capacitance connection for Charge Pump
10	CP3	MISC	Capacitance connection for Charge Pump
11	GPOUT	OUT	General Purpose Output (Test monitor)
12	XFG	OUT	Motor speed signal output, internally pulled up to SIOV
13	RDY	OUT	Device ready signal Internally pulled up to SIOV
14	SSZ	IN	SIO Slave Select Low active input terminal
15	SCLK	IN	SIO Serial clock input terminal
16	SIMO	IN	SIO Slave Input Master Output terminal
17	SOMI	OUT	SIO Slave Output Master Input terminal
18	SIOV	PS	Power supply terminal for Serial Port 3.3V typical
19	XRSTIN	IN	RESET input terminal to disable the driver IC
20	PULL_CTL	IN	Object lends pull control input (Pull by Lo) Open or L at non using pull control function.
21	VLDDIN	IN	Laser diode control analog signal input 0 to 3V terminal Required to set register when use VLDDIN input. Open in case of non use analog input.
22	CV3P3	MISC	Capacitance terminal for internal 3.3V core (typ 0.1uF)
23	AGND/DGND	PS	Ground terminal for internal digital and analog
24	A9P5V	PS	Power supply terminal 9.5V Laser diode for BD
25	ILDD_BD	OUT	Laser diode for BD output terminal
26	ILDD_DVD	OUT	Laser diode for DVD output terminal
27	ILDD_CD	OUT	Laser diode for CD output terminal
28	CP5V	MISC	The capacitance connection terminal for control system power supply 0.1uF or lager decoupling capacitor should be connected.
29	LOAD_P	OUT	Load positive output terminal
30	LOAD_N	OUT	Load negative output terminal
31	P5V12L	PS	The power supply terminal (5V or 12V) for Load driver output stages.
32	ICTL	MISC	The capacitance connection terminal for pull control gate driver 0.1uF or lager decoupling capacitor should be connected. Open at non using pull control function.
33	CHG	PS	The capacitance connection terminal for lends pull control 200uF or larger capacitance is recommended Tie P5V at non using pull control function.
34	P5V_1	PS	Power supply terminal for Tilt/Fcs/Trk drivers
35	TLT_N	OUT	Tilt negative output terminal
36	TLT_P	OUT	Tilt positive output terminal
37	TRK_P	OUT	Tracking positive output terminal
38	TRK_N	OUT	Tracking negative output terminal
39	FCS_P	OUT	Focus positive output terminal
40	FCS_N	OUT	Focus negative output terminal
41	PGND_1	PS	GND terminal for Ti/F/T channel drivers
42	P12V_1	PS	Power supply terminal for 12V driver output stage
43	U	OUT	U phase output terminal for spindle motor
44	ICOM1	MISC	Current sense resister terminal for spindle driver
45	V	OUT	V phase output terminal for spindle motor
46	P12V_2	PS	Power supply terminal for 12V driver output stage
47	W	OUT	W phase output terminal for spindle motor
48	ICOM2	MISC	Current sense resister terminal for spindle driver

49	MCOM	IN	Motor center tap connection
50	ISENSE	IN	Current sense input terminal for spindle drivers
51	AGND	PS	Ground terminal for internal analog
52	STP1_P	OUT	STP1 positive output terminal for collimator
53	STP1_N	OUT	STP1 negative output terminal for collimator
54	STP2_P	OUT	STP2 positive output terminal for collimator
55	STP2_N	OUT	STP2 negative output terminal for collimator
56	P5V_2	PS	Power supply terminal for 5V driver output

U26 Audio A/D IC -AK5358K

1. Block diagram

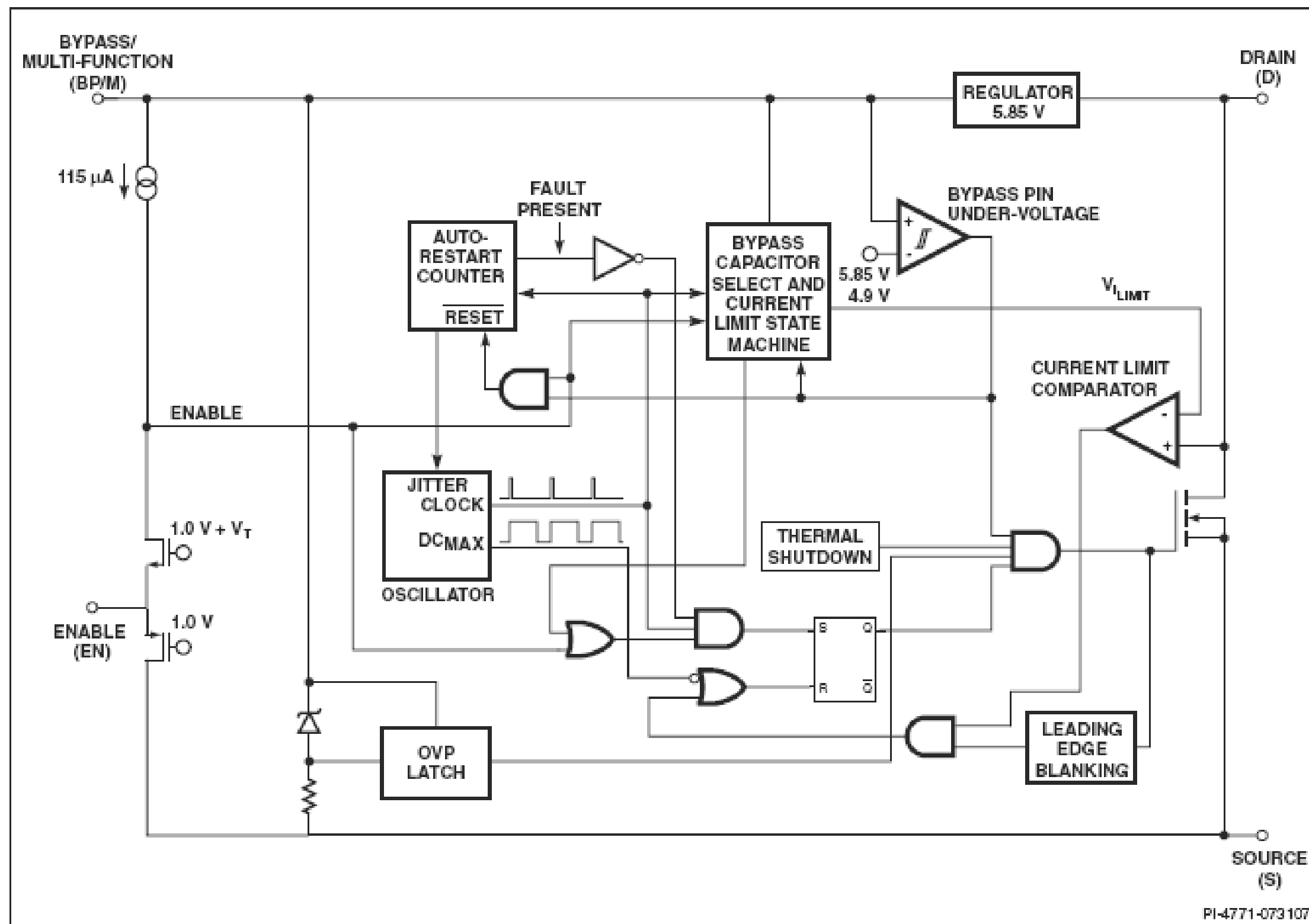




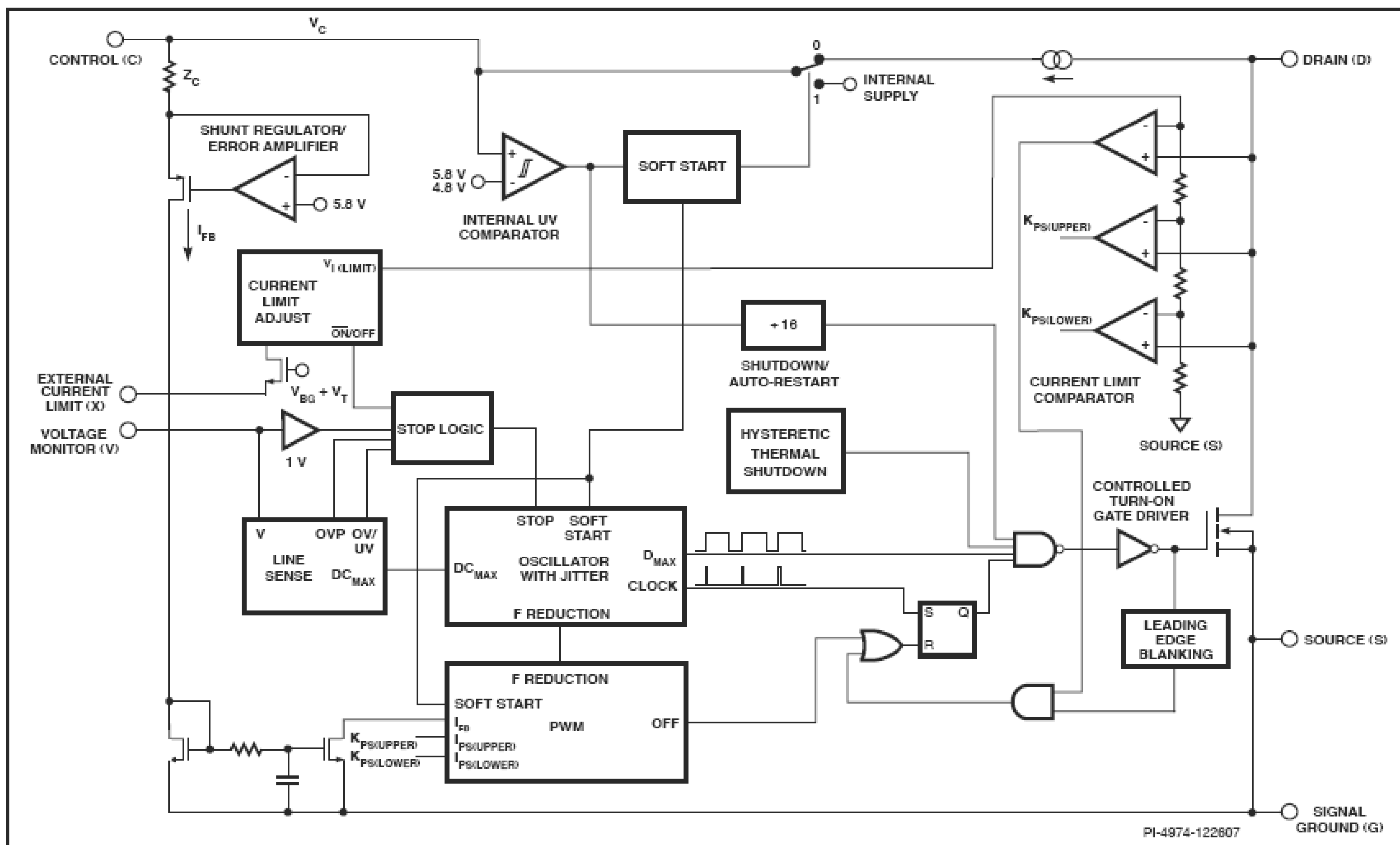
3. Pin Function

No.	Pin Name	I/O	Function
1	AINR	I	Rch Analog Input Pin
2	AINL	I	Lch Analog Input Pin
3	CKS1	I	Mode Select 1 Pin
4	VCOM	O	Common Voltage Output Pin, VA/2 Bias voltage of ADC input.
5	AGND	-	Analog Ground Pin
6	VA	-	Analog Power Supply Pin, 4.5 ~ 5.5V
7	VD	-	Digital Power Supply Pin, 2.7 ~ 5.5V
8	DGND	-	Digital Ground Pin
9	SDTO	O	Audio Serial Data Output Pin "L" Output at Power-down mode.
10	LRCK	I/O	Output Channel Clock Pin "L" Output in Master Mode at Power-down mode.
11	MCLK	I	Master Clock Input Pin
12	SCLK	I/O	Audio Serial Data Clock Pin "L" Output in Master Mode at Power-down mode.
13	PDN	I	Power Down Mode & Reset Pin "H": Power up, "L": Power down & Reset The AK5358A must be reset once upon power-up.
14	DIF	I	Audio Interface Format Pin "H": 24bit I ² S Compatible, "L": 24bit MSB justified
15	CKS2	I	Mode Select 2 Pin
16	CKS0	I	Mode Select 0 Pin

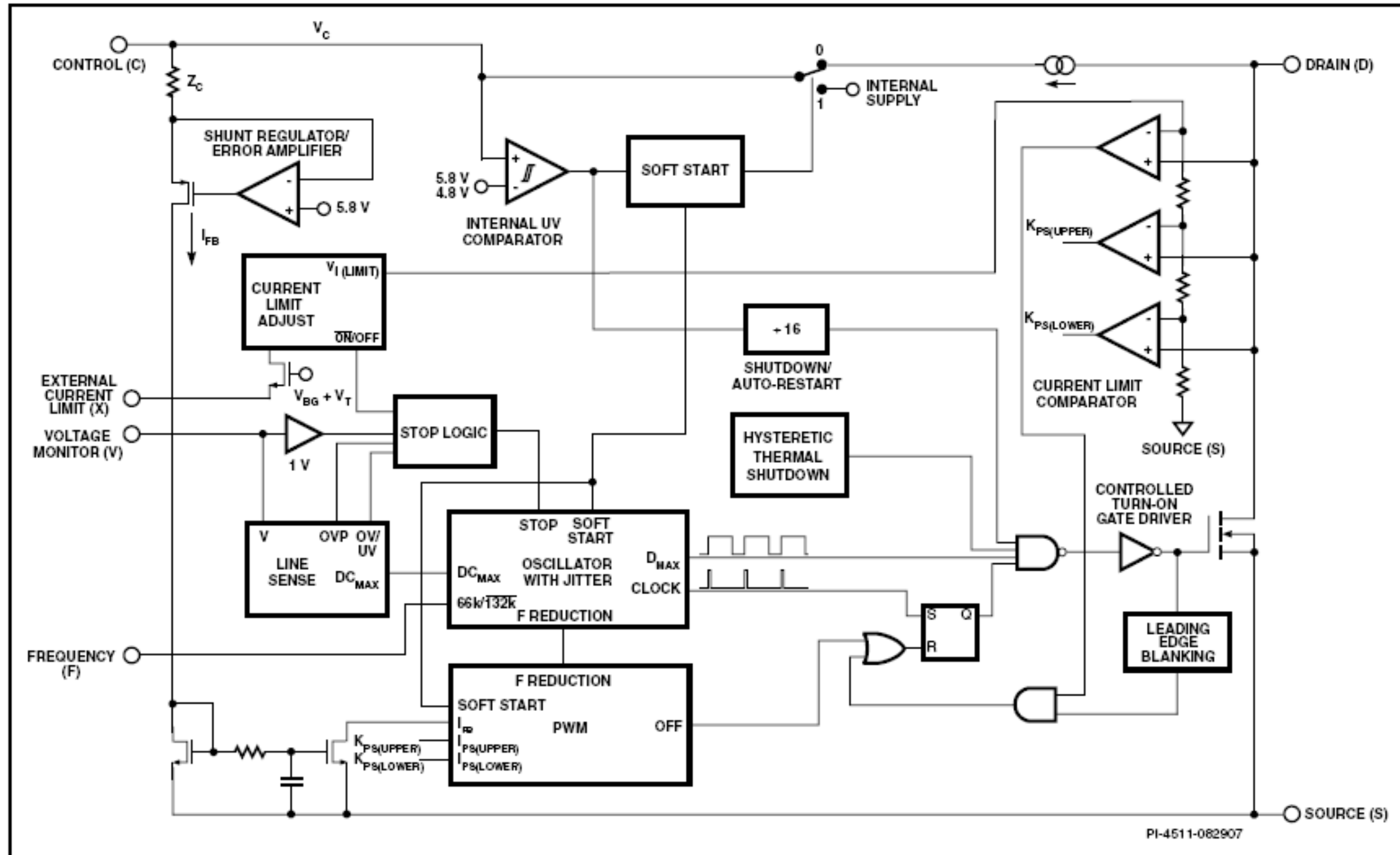
U531 Internal IC Diagram-TNY179EN on Power Board:



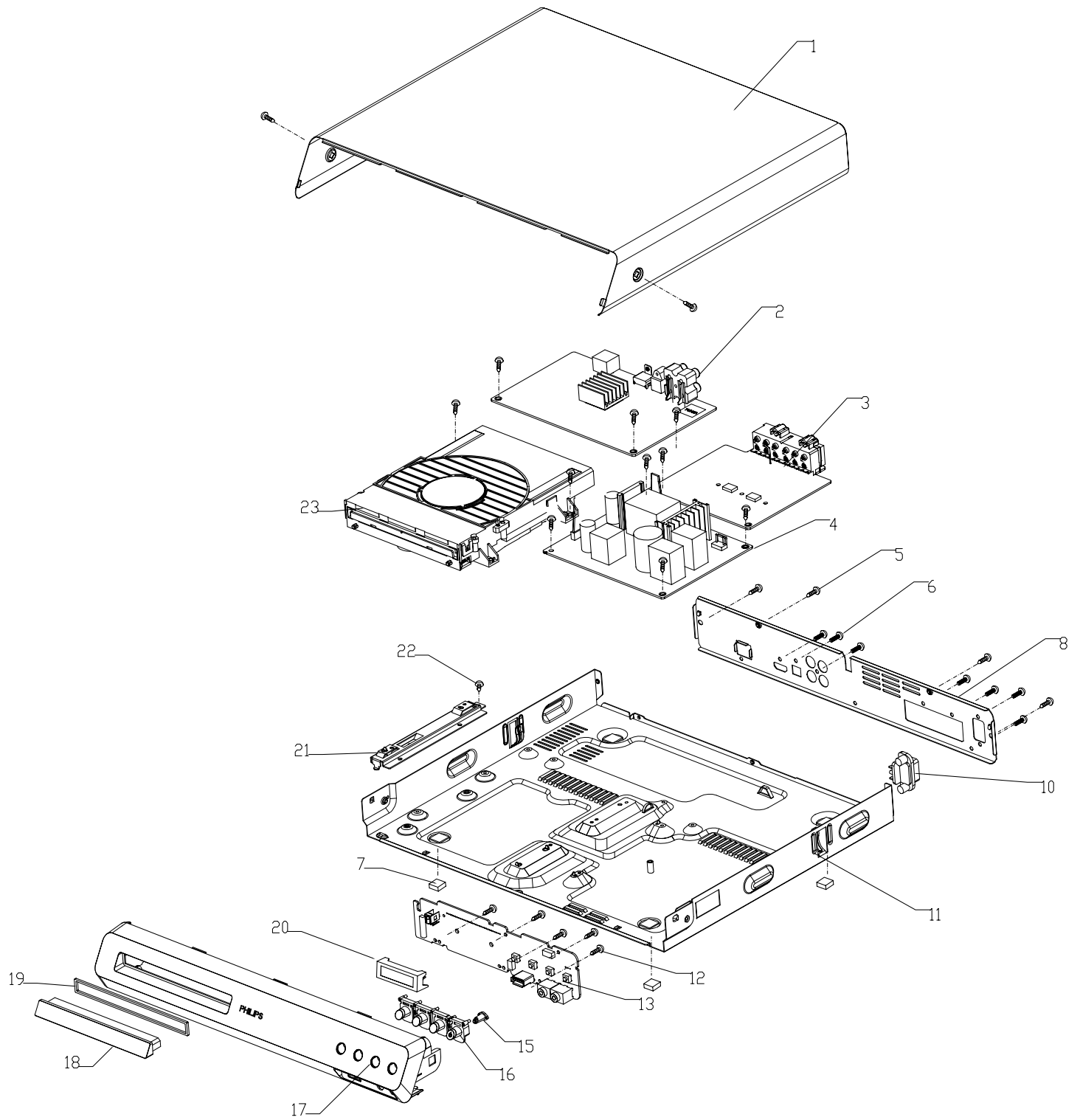
U534 Internal IC Diagram-TOP260EN on Power Board:



U534 IC TOP258EN Diagram on Power Board:



Exploded View of HTB3560/12 /78 K/98 /94/40/55:



REVISION LIST

Version 1.0

* Initial release for HTB3560/12/78

Version 1.1

* Initial release for HTB3560K/98

Version 1.2

* Initial release for HTB3560/94

Version 1.3

* Initial release for HTB3560/40/55